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PSYCHOLOGY OF ÆSTHETICS.

I. EXPERIMENTAL PROSPECTING IN THE FIELD OF THE COMIC.

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This investigation was undertaken for the purpose of becoming directly and personally acquainted with some of the problems involved in that which is termed "the comic," and to ascertain by actual trial the possibility of applying satisfactorily certain well-known psychological methods to the solution of such problems.

In this work of orientation the following methods were employed :

A. *Undirected Introspection*. Here only workers of long experience in the psychological laboratory participated. Three series of observations were made—*Series a*, serial method—the comic pictures were shown in turn to the reagent and he recorded his introspections. *Series b*, paired method—two comic pictures were presented simultaneously to the reagent for the same purpose. *Series c*, in which a single comic picture was placed before the reagent for five minutes to observe and report on the course of the comic impression. For summary see pp. 37, 38, 39.

B. *Experiment*. Six series of experiments were made in which the various psychophysical methods were applied to investigating the comic: *Series I*, in which the *method of impression with serial judgments* was used to ascertain: (1) the constancy of the comic impression, (a) from day to day, (b) from moment to moment; (2) whether the comic impression was renewed, increased, or decreased through interspersing pictures not before seen, through forced or spontaneous laughter, through drinking coffee, through sickness and low spirits, through rigid holding of the body or through laying aside the pictures that had ceased to be funny for several months and then re-examining them. *Series II*, in which the *method of constant differences* was employed to learn whether time and space differences ("errors") were present in experiments with comic pictures. *Series III*. Here the *method of averages* (suggested by method of "average error") was used (1) to find in what direction a preceding comic or sad picture affected the judgment of the succeeding comic picture, and (2) to investigate the relation of smiling and laughter, or a tendency in that direction, to the judgment given regarding the degree of funniness. *Series IV* was a mass experiment in which the *method of choice* was applied to ascertaining, (1) the influence of smiling and sober faces upon the comic impression; (2) the effect of the size of a picture upon the strength of the comic impression. (3) In this connection experiments were also made to find out the effect of movement upon the comic impression. *Series V*. The *method of gradual variation* (suggested by the method of "minimal changes") was used for the purpose of determining whether there is in the case of a single individual or of individuals as a

whole, any particular degree of exaggeration which makes a given thing most comical. *Series VI.* The *method of expression* was applied to ascertain the peculiarities of the pneumographic and sphygmographic curves when the stimuli were comic pictures. For summaries see p. 83.

C. *Directed Introspection.* The introspection was directed by means of a questionnaire. Since all previous investigation of the comic has been equivalent to using a questionnaire and one person answering the questions, it has seemed desirable to employ this method also, in spite of the fact that suggestion must play an important rôle in using it. Moreover, an attempt has been made to give this method in some slight degree the character of a psychophysical measurement method through the introduction of judgment categories and a comparison of the introspections regarding the phenomena observed with the judgments given. In one case, that of imitation, the conclusions drawn from the questionnaire have been put to the test of experiment in which persons who had had experience in the psychological laboratory took part. For summaries see pp. 89, 91, 96, 99, 104, etc.

The material was largely composed of pictures (a few of which are reproduced in Plates I-VII) taken from the periodicals mentioned below.

A. UNDIRECTED INTROSPECTION.

Series (a), Serial Method. Material. A set of 28 pictures. These pictures, as well as those used in other experimental series, were selected from *Life*, *Puck* (The Journal, Pickings, Library, and the Quarterly), *Judge* (the weekly Periodical, Library, Quarterly), *Sis Hopkins*, *Foolish Book*, *Just Fun*, College comic papers (*Harvard Lampoon*, *The Widow*, *The Tiger*, *The Yale Record*, *The Columbia Jester*, *Punch Bowl*, *Wrinkle*, *Sphinx*, and *The Chaparral*), *Punch*, *Fliegende-Blätter*, *Jugend*, *Meggendorfer-Blätter*, *Simplicissimus*, *Le Rire*, and from the comic illustrations in the Sunday newspapers and other periodicals. Variety as regards subject and degrees of funniness alone was considered in making the selection of pictures at first, but as experience increased, naturally many other things were considered, as the nature of the subject treated, character of the accompanying legend, simplicity of presentation, the size of the picture, etc. *Reagents.* Dr. Angell (A); Miss Crandall (C), and Mr. Borgquist (B),—both advanced students in Psychology; and myself (M). *Mode of procedure.* The above pictures were laid in turn before the reagent and he wrote down his introspections.

Results: Suggestion. This method was selected with a view to eliminating the element of suggestion, but the results show

that it does not entirely do so. The reagents report that the mouth is often ready to smile before the picture appears; that a smiling face in a picture often makes one smile and say "funny" when one finds later that there is nothing really funny in the picture; that certain objects—monkeys, goats, an artist's name, etc., in a picture act as symbols of fun, the judgment being partly and sometimes wholly determined by these minor details, though the real joke lies elsewhere; that the feelings and ideas which accompany one picture are sometimes carried over to the next and partially determine its funniness; that one sometimes feels that the picture ought to be funny and involuntarily sets his lips in a position of smiling and gives a judgment in harmony with this feeling, and that one can occasionally renew the funniness of a picture by a slight effort of thought or feeling and, perhaps involuntarily produce this feeling in the first place; and that a smile or laugh or any expression showing the experimenter's opinion of a picture tends to affect the judgment of the reagent. *Influence of the physical and mental condition on the judgment.* A's introspections seem to show that the judgment is affected by one's physical condition.

The above introspections, as well as many others not here recorded, directly or indirectly suggested the experiments subsequently made. Considered from the standpoint of mere orientation no other series has been as fruitful as this.

Series (b), Paired Method (suggested by the method of paired comparison). *Material and Reagents.* Same as in Series (a). *Mode of procedure.* Two pictures were presented simultaneously to the reagent for comparison and the recording of introspections. One picture remained before him until all the others had been compared with it. It was then laid aside and one of the remaining pictures was used as a standard and the remaining others compared with it. This was repeated until each picture had been compared with all the others. This manner of presenting the pictures was employed simply as a matter of convenience. The results show, however, that it is well adapted to investigating certain phases of the comic because it allows one to study the effect on the judgments when, (1) a picture remains continuously before a reagent for some time; (2) when a picture is seen but for a short time several days in succession; (3) when a picture is laid aside for a period and then re-examined.

Results. The most important thing that came up in this series of experiments is the question regarding the investigating of the comic by the various psychophysical methods applied in the usual manner, that is, by the reusing of the same material many times with the same reagent.

C asserts over and over again that the pictures are decreasing in funniness, and in the giving of pleasure, and that she is giving her judgments from her memory of former impressions. She says this came to her as a matter of great surprise although she now sees it was to have been expected in view of the use of the terms trite, stale, etc., in daily life in connection with old jokes. M also is astonished at her double use of the word comic—in one case to indicate that a joke is clever and in the other that it is really funny. In the first sense the word funny could be always applied by a person to a good joke, but in the second only when a joke was new to him. B makes an assertion similar to that of C. A ceases to laugh and the expressions "trite," "stale," "distasteful," etc., daily increase. On one occasion he even complains of nausea on reseeing a picture which he has previously seen many times and which he had at first thought funny.

Series (c). To observe the course of the comic impression. *Material.* A comic picture not previously seen. *Mode of procedure.* The picture was placed before the reagent for five minutes, at the end of which time he wrote down his introspections. *Reagents.* Same as in Series (a).

Results. The reports of the reagents show that a picture at first comic may become not only indifferent or distasteful but decidedly unpleasant when examined for a continuous period.

B. EXPERIMENT.

To ascertain the possibility of satisfactorily applying the various psychophysical measurement methods to the investigation of the comic.

Series 1. Method of Impression with Serial Judgments. (1) a. To determine the constancy of the comic impression from day to day. *Material.* 40 pictures (in case of reagents F, J, and G) and 26 (in case of reagents K and Jt), chosen from the periodicals mentioned above. The pictures were mounted on sheets of white paper $8\frac{1}{2} \times 11$ in. *Reagents.* Miss Jewett (F), Mrs. Byrd (J), Mr. Kuhn (K), Mr. Jewett (Jt), and G. Branner (G), a lad of thirteen with a keen sense of the ludicrous and a reader of comic papers. *Method.* The pictures were laid in turn on a table directly before the reagent for fifteen seconds. He was directed to use the following terms in giving his judgments: exceedingly funny¹ (c, b, a), very

¹ The word "funny" has been employed throughout the investigation. It was selected because more general in its significance and freer from the personal theories which experience had shown to be connected with other words, which at first appeared more appropriate, or perhaps I should say, sufficiently dignified to be used in a scientific study. The aim was to obtain a medium through which the reagents

funny (c, b, a), moderately funny (c, b, a), slightly funny (c, b, a), do not know whether funny or not (c, b, a), indifferent or not funny, the letters *c, b, a* indicating respectively, the lowest, medium and highest form of the particular judgment category, and to give his introspections to protocol. Not only in this series of experiments but in all others the reagents were kept in all possible ignorance regarding the purpose of the investigation. The experimental conditions from day to day were also made as uniform as possible.

Results. In Column R of the table below are the names of the reagents ; in I, the number of pictures judged funny the first day ; in II A, the number of pictures judged on second day the same as on first day ; in II B, the number of pictures judged funnier than the first day ; in II C, the number of pictures judged less funny than the first day but not o ; in II D, the number of pictures judged o as regards funniness ; III A-D, IV A-D, etc., give the results for the third, fourth, etc., days respectively as compared with the first.

TABLE I.

R	I	II				III				IV				V				VI			
		A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
F	38	9	11	18	2	4	2	13	21												
J	39	10	10	18	2	7	10	21	2	3	9	22	6	3	4	27	6				
G	39	3	18	16	3	9	20	10	1	6	21	12	1	9	14	16	1	6	21	12	1
K	21	3	4	15	4	3	3	18	2	1	1	14	10								
Jt	19	2	17	2	5	3	13	8	2	2	7	9	8								

The increase in funniness from day to day observable in Table I (columns headed B), in case of all the reagents, is readily explained from the introspections which show that comic features not at first observed were later noted. In the case of Jt this is so marked that on the second day it overcomes the loss in funniness which characterized the series as a whole in his case.

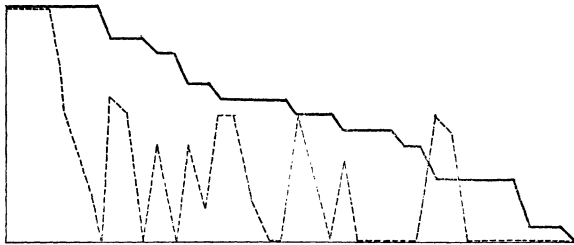
In case of F, J, K, and Jt the pictures as a set steadily decrease in funniness from day to day, though the results show a more rapid decrease in the case of F than of the other reagents. F remarks on the 3d day that some few of the pictures may always remain a "little" funny but, as a whole, they do not seem funny to her and she hopes she may never see them again.

Curves are given below for J (I) and F (II) showing how

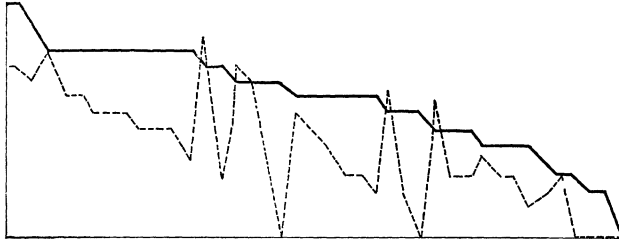
would be able satisfactorily to express their feelings in connection with a certain class of pictures and, in general, the word "funny" has been found adequate.

the loss in funniness affected the individual pictures. The judgments of the first day are represented by the heavy line, and the dotted line shows the judgments on the same pictures on the last experiment day. The ordinates represent the judgments given on each of the pictures. The forty pictures are arranged on the abscissa in order of funniness on the first day beginning at the left with the one which is funniest.

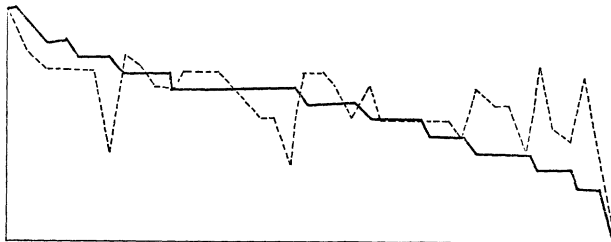
An examination of curves I and II shows that in general the loss in funniness depends upon the degree of funniness of the picture. Curves constructed for Jt and K take a course similar to that of the two curves just given.



CURVE I.



CURVE II.



CURVE III.

G's curve (III) does not bring out any law, and in general his results are difficult to understand. He was asked at the close of the experiment why he said a picture was funny, and

allied questions, with the hope of getting some light on the subject. He said a picture was funny when it made him "laugh" and when it gave him "pleasure" and that in giving his judgment on a picture at first he thought more of whether it made him "feel like laughing." The presumption is, that the reagent, who is an unusually intelligent boy, tried to make his judgments consistent. He knew the pictures were the same as at first and it seemed to him he ought to give the same judgment. The feeling that one ought to find a picture funny after it has ceased to be funny has been noted by several of the more experienced reagents. From this and allied experiences it would seem that *in investigating the comic the reagents should be instructed to give their judgments upon present and not upon the memory of past impressions.*

Without the reagent's knowledge a record concerning his laughter and smiling was made in connection with each judgment. In case of F and J the laughter and even smiling largely disappears after the first day though these reagents occasionally mention in their introspections that they feel like laughing. The disappearance of laughter and of smiling is much more gradual in case of G, indeed even on the last day some pictures evoked a broad smile or laugh. In view of all these results, it is evident, that in applying psychophysical methods to the investigating of the comic we have a special kind of positive and negative time-influence to deal with. We see, moreover, from what has been found, that "practice" must finally result in the destruction of the comic impression. This will explain why, throughout this investigation, new material is substituted for the old in the verification of a given point with a given reagent and not, as is customary in psychophysical experimentation, the old material reused and long series of experiments made to obtain constancy and certainty of judgment.

Series 1. Method of Impression with Serial Judgments. (1) b. To find the effect of the lapse of time upon the comic impression when the exposure of the picture is continued. *Material.* Fifty pictures chosen from the periodicals previously mentioned, without legend or title and mounted as before. As a whole the individual pictures of this set contained but few and rather simple comic elements, that is, details which in themselves were funny. Each picture was covered by a sheet of white paper upon the centre of which a fixation point had been marked. *Reagents.* Five students attending lectures on the Psychology of the Social Relations, Mr. Perry (P) an advanced student in psychology and myself (M). M's results are omitted because the fun of the pictures even with longer pauses was rarely renewed. The results of two of the three students whose results are omitted follow the course of the three re-

ported, but those reagents found so few of the pictures used funny, that it is thought the addition of the data obtained with them would add little in a confirmatory way. The omitted results of the third student are very irregular. This irregularity doubtless grows out of the almost ceaseless train of associations—some amusing and others not.

Method. The observer sat at a table opposite the experimenter. When the "ready" signal was given he directed his eyes to the fixation point. The experimenter (Miss M. Holmes conducted this and the following set of experiments and worked up the results) noted on a stop watch the time of removing the cover of the picture, that at which the reagent reported it to be or not to be funny and if funny, that at which it ceased to be funny. When the picture ceased to be funny, the experimenter covered it and after a pause of ten seconds, during which the reagent was asked to banish the picture from his mind, the picture was again exposed and the same time records made as in the first exposure. There were three such exposure and rest periods. At the close of the third exposure period the reagent reported, the terms "slightly funny" recorded as (1), "moderately funny" recorded as (2), or "very funny" recorded as (3), with the suffixes + and—(these having been given him previously for the purpose), on his memory of the funniness of the picture, adding to his report anything that occurred to him in the way of introspection. The experiments were repeated with the same pictures at two other sittings, separated by more than 24 hours.

Table II contains the results for three reagents. The numbers under *a*, time of first, *b*, time of second, *c*, time of third, and *d*, time of fourth exposures, indicate the whole number of seconds the pictures were exposed in a given exposure. Under the results for the first and second sittings and the totals, the whole time given was actually obtained by experiment, but for purposes of comparison the time obtained by using only twenty-five of the pictures (selected at random) at the third sitting has been doubled.

TABLE II.

Re- agents.	1st sitting.				2nd sitting.				3rd sitting.				Totals.			
	a	b	c	d	a	b	c	d	a	b	c	d	a	b	c	d
P	1638	664	346	178	416	69	27	42	322	36	8	0	2215	751	377	220
R. B.	1262	324	206	149	632	236	152	116	468	208	138	144	2128	664	427	337
E. H.	498	259	86	11	366	177	61	5	212	128	56	12	970	500	175	22
Total.	3398	1247	638	338	1414	482	240	163	1002	372	202	156	5313	1915	979	579

Tables omitted here for lack of space were also made to ascertain how the averages of Table II held in the details of the experiment. These tables supply one with the information usually obtained from the mean variation which is not computable here. They showed the number of times the duration of fun in any exposure was greater than, equal to, or less than in the previous exposure on the same day and on successive days, and confirmed in details the mass results of Table II, namely that with few exceptions traceable to various causes, *the continuance of fun decreases (1) in successive exposures at a given sitting and, (2) with a given exposure at successive sittings.*

TABLE III.

Reagents	I.			II.			Totals.		
	+	=	—	+	=	—	+	=	—
P.	2	4	30	2	1	4	4	5	34
R. B.	5	16	29	3	10	12	8	26	41
E. H.	10	8	30	2	6	15	12	14	45
	17	28	89	7	17	31	24	45	120

Table III, Column I + shows the number of pictures judged funnier, I = equally funny, and I — less funny, the second day as compared with the first. II, +, =, —, give the same for the third day as compared with the second. This table confirms the results of previous experiments in that it shows that *repeated seeing decreases the funniness of pictures.*

Tables, omitted here again for lack of space, were made for each of the reagents to ascertain the average duration of fun corresponding to the various classes of judgments. The mean variation was occasionally large but in spite of this fact the tables showed conclusively that the shorter the duration of fun the lower the judgment, that is to say, *duration of fun and degree of fun go hand in hand.* Moreover, the average time corresponding to a given judgment, while varying in case of the different reagents, remained approximately the same from day to day for the same reagent.

The question arises as to what it is that determines the duration of the fun in a comic picture. The introspections of the reagents as well as the observations of the experimenter point to the complexity of the picture as that which largely governs the duration of its fun—the more complex a picture is, the more fun centres (comic elements or details) present, the longer

the fun lasts. The introspections of the reagents also show that a smiling face in a picture tends not only to prolong, but sometimes even to make its funniness. This is attributable doubtless partially to the involuntary tendency to imitate the smile in the picture, which is shown to be present by such phrases as "the grin is catching," "the fun is contagious," "the smile in that face puts one in a good humor," "I love to laugh with that old man," etc. We have here, as elsewhere in this investigation, an illustration of what is frequently observed on the stage and in daily life, that a smiling or laughing face is a very important fun producing and continuing factor.

Before passing to the next series, attention should be drawn to the significance of this one from the standpoint of method. It is evident that *the kind of judgment given will depend more or less upon the time the pictures are exposed.*

The next experiments were devised to ascertain whether the judgment regarding the degree of funniness and the fun duration of a picture are dependent, as was above conjectured, upon the number of fun centres in the picture. *Material.* 175 pictures of approximately the same size but varying greatly in complexity. These pictures contained no legend or smiling faces, and were mounted as before. *Reagents.* Ten students attending lectures on the Psychology of the Social Relations.

Method. The experiments were conducted as were those just discussed and the same reports were made as regards the degree and duration of funniness. At the end of a test, and before the picture was removed, the reagents counted up and reported upon the number of fun centres found, also as to whether they had seen the picture before and whether they had had any associations which determined its funniness. In making the following table all cases where a picture was judged not funny, where there was an association called up which produced its fun, or where the picture had been previously seen, are omitted.

Results. In Table IV, below, the sections 3, 2, 1, contain the results for the judgments, "very funny," "moderately funny," and "slightly funny," respectively. Column I under each section gives the average time in seconds that the pictures with the corresponding judgments remained funny, II the average number of points of fun for that judgment, and III the number of pictures so judged.

The results confirm the conclusion drawn from previous series, namely, that on the average the degree of funniness and the fun duration go hand in hand. They show further, as was previously conjectured, that *the judgment of the funniness and the fun duration decrease and increase with the decrease and increase in the number of fun centres.*

TABLE IV.

Reagents	3			2			1		
	I.	II.	III.	I.	II.	III.	I.	II.	III.
A. L.	18	2	2	9	4.4	22	7	1.7	25
C. S.	23	4.5	4	14	2.9	14	8	1.6	26
M. H.	148	24	5	32	9	4	22	5	11
F. S.	70	4	1	24	3.1	32	19	1.9	18
E. H.	49	7.6	3	33	4.2	22	19	2.2	5
S. C. ¹	37	6.3	4	22	4.4	16	14	2	4
S. C. ²	48	6.7	7	28	4.4	12	18	1.8	5
R. B.	51	20	4	33	20.3	6	16	10.4	15
T. N.	14	3.2	11	15	2.4	28	13	1.7	12
J. D.	22	4.7	21	15	3.5	69	10	1.8	22
B. M.			0	335	2	1	33	1.8	19

The fact that the duration of fun increases with the number of fun centres is partially explained by supposing that the mind in passing and repassing from one centre of fun to another gets that rest or respite which the previous set of experiments has shown to result in a renewal of the fun.

The fact that the higher judgments occur in connection with pictures having the greatest number of fun centres is explainable doubtless by supposing that the feeling of fun accompanying the seeing of one fun centre may be transferred to the next and thereby increase the feeling of fun arising in connection with it, as is shown with successive pictures in the experiments of Series 1, 2, p. 47.

In these results we have also something of interest as to the manner of applying psychophysical methods. It would seem that the reagent should be instructed in looking at a comic picture to look at various parts of the picture and not confine his attention to any one portion—in short, *to examine it with a roving eye rather than with a steady gaze*. These experiments are also suggestive as regards the execution of comic pictures. They lead one to lay very much greater stress on the importance of making the minor details comic in themselves, and to insist that they do not distract but help the kind of attention needed in examining such pictures most satisfactorily. The results are interesting, too, in showing how greatly people differ in the noticing of details and suggest great differences as regards complexity in that which determines the judgments of different individuals.

Fun-Fatigue and Fun-Accumulation. The results recorded in Table II of the three reagents P., R. B., and E. H., were examined with a view to ascertaining whether there was any trace of the "fatigue for wit" of which Dr. Hall speaks.¹

The fun time for the various classes of judgments has been computed for the first half and the last half of the experimental hour of each experiment day. A comparison of the results shows in case of each of the three reagents that the time was longer in some cases and shorter in others. This agrees with the results gained in connection with experiments of Series 1 (1) a, where the order of presenting the pictures to the reagent was reversed on successive days and the results compared with this in view. Without doubt very long series of experiments would show fun-fatigue as a controlling factor, but the influence of one comic picture on another as regards the comic impression, investigated in this and other experiment series, and the experiences of every day life as well as the above results, show that fun accumulation may be a controlling factor in a short series.

Series 1, (2). These experiments were made to ascertain whether the comic impression from a given picture could be increased, decreased or renewed. The same pictures were used and the same reagents participated as in Series 1 (1), a.

A, B, C, D in Table V have the same meaning as in Table I, the comparison being made with the results obtained on the last day of those experiments. For example, in case of reagent F, 4 under A means that in this set of experiments 4 pictures were judged the same as on the last day of the experiments recorded in Table I; 21 under B, that 21 pictures were judged higher; 11 under C, that 11 pictures were judged lower; and 4 under D, that 4 pictures were judged 0.

The results in Column I were obtained when each of the pictures which had been used in the previous set of experiments was preceded by a fore-picture (a comic picture not previously seen, a picture representing the crucifixion or entombment, or a landscape), in II when the reagent forced himself to laugh while looking at the picture, in III when Mother Goose was read during the examination of the picture, in IV after finishing the foregoing experiments, in V after drinking a cup of strong coffee, in VI after not having seen the comic pictures for more than five months.

The results show that the seeing of the new pictures before those that had been previously seen decidedly increased the funniness of the latter for F, whose introspections show that

¹Hall and Allin: The Psychology of Tickling, Laughing and the Comic, *American Journal of Psychology*, IX, 29.

TABLE V.

R.	I.				II.				III.				IV.				V.				VI.			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
F.	4	21	11	4																	5	26	5	4
J.	5	4	23	8																				
G.	10	15	14	1													3	23	1	13	5	22	12	1
K.					2	23	1	0	0	20	5	1												
Jt.					1	25	0	0	2	22	2	0	3	9	10	4								

the new pictures were a "surprise," a "rest," a "relief." For G the presence of the fore-pictures altered the judgments of the old pictures as regards funniness, but did not increase or decrease the comic effect as a whole. The decrease in comic effect for J, who is an ardent catholic, is explained by the fact that one-fourth of the pictures shown before the comic pictures were those of the crucifixion or of the entombment. This opinion is confirmed by J's remark that the pictures had given her a "shock."

The table shows that forced laughter and laughter spontaneously produced through reading selections from Mother Goose while pictures were being examined, helps the comic effect. By comparing the results under IV with those under II and III for it one sees that the increase in funniness is not due to a time influence.

The table also shows in the case of the one reagent experimented upon, as I had suspected from tests which I had made upon myself during Series a, that coffee helps the comic effect. Subsequently a set of experiments was made with reagent J to ascertain whether the physical and mental condition would affect the results as the reagents in Series a and b had thought. On the first day of experimentation J was not well and in low spirits and judged but 35 of the 58 pictures used as funny. Some days afterwards when she had recovered her health and spirits, 48 of the 58 pictures previously seen seemed funny to her. Of these 48 pictures 23 were judged as on the first day, 33 higher and but 3 lower, although the tendency on her part to lower judgments on a second exposure would have made us expect that such judgments would have preponderated.

The results when the pictures had not been seen for five months show that for F and J the pictures had regained in funniness. Both noted a decided change as regards the standard used; features not observed before were now noted and determined the judgment. Old features not funny before were now the basis of judgment. It was also occasionally observed that features which were originally funny, but which had lost their funniness in the course of experimentation, had renewed their funniness.

As in psychological experiments in connection with the eye head rests, fixation points, etc., are employed to insure uniformity of position, and as rigidity of position must result to a greater or less extent from employing such aids, it seemed desirable, in view of the results obtained in experimenting with forced and spontaneous laughter, to test A's supposition, in connection with the experiments of Series a and b, that physical repression would be detrimental to the comic impression; and the next experiments were undertaken with this in view.

The same judgment terms were used as before and the pictures were laid before the reagent in turn. On the first day the reagent was instructed to hold his body rigid and not even to make the movements he usually made in laughing. On the second day he was told to hold his body as he pleased while looking at the pictures and to make any movements he chose. The numbers given in the table below refer to the results of the second day as compared with the first: that is, A, B, C, Column I, give the number of judgments respectively equal to, higher than and lower than those of the first day for the reagents A. M., etc.

TABLE VI.

I.	A. M.	A. A. M.	E. P.	N. S.	P. W.	A. G.	E. S.	G. L.
A	25	32	22	30	28	30	27	24
B	23	14	26	23	2	13	16	17
C	10	12	10	5	8	15	15	17

The above table shows that in case of four of the eight reagents who took part, the higher and lower judgments of the second day as compared with the first are approximately equal. The supposition of two of these four reagents that the pictures were much funnier when they were "not allowed to laugh" is, therefore, not confirmed by these results. The other four reagents, in spite of the fact that they had previously seen the pictures, found them much funnier when allowed to move and take any position desired. In view of these results it would seem in experimenting upon the comic that as far as possible *reagents should be allowed freedom as regards position.*

*Series 2. Method of Constant Differences.*¹ To learn whether time and space differences ("errors") are present in comparing comic pictures. *Material.* The fifty pictures employed in this series were selected with much more care than in Series b. Single pictures were chosen, those easily seen, similar in size, and with a short legend² which directed attention to the con-

¹The advantage of thus designating the "Method of Right and Wrong Cases" is very evident when one applies the method to investigations in æsthetics. See Martin u. Müller, *Zur Analyse der Unterschiedsempfindlichkeit*, I.

²The greatest difficulty in the selecting of pictures for all these experiments has been in connection with the legends. These must not be so long or so complicated as to take the attention from the picture itself. On the other hand, they must not be too short or the picture will not be understood. People as a whole do not find pictures without legends as interesting or funny. The greatest difficulty, however, is the want of agreement as regards funniness, between the legend and

tent of the picture rather than to its own content. The pictures were mounted on sheets of white paper $8\frac{1}{2} \times 11$ in. and laid side by side directly in front of the reagent whose chin rested on a support and whose head remained stationary during the experiment. *Reagents.* Dr. Angell (A), J. Branner (Br), a lad of seventeen, and myself (M).

Method. To obtain a norm, the same method was employed on the first day as in Series I, and from the pictures judged "moderately funny," one picture (the same one in case of M and Br) was selected as norm and with this picture all the others were compared. On the second day the norm was placed at reagent's right and exposed first (designated as Time and Space Order I). On third day the pictures were reversed as regards position and the comparison was exposed first and the norm second (designated as Time and Space Order IV). On fourth day the pictures were put in the same position as on the third day but the norm was exposed first (designated as Time and Space Order III). On fifth day pictures were in same position as on second day but the comparison was exposed first (designated as Time and Space Order II). On the sixth, seventh, eighth and ninth days the time and space orders were employed in the following order: IV, I, II, III. The above succession in employing the various time and space orders was arranged with a view to equalizing as far as possible the loss in funniness and in this way to ascertain whether the usual time and space differences ("errors") were present.

The following terms were given to the reagents to be used in making their judgments: "very much funnier," "much funnier," "funnier," "slightly funnier," and their converse, "do not know whether funnier or not," "equally funny;" and they were asked to read the legends of the pictures each time they were shown, to look at the pictures during the whole time of exposure (15 sec.), and to give their judgments, made on the present impressions and not on the memory of some former impression, on the second picture exposed, after it had been covered.

All judgments are transformed so as to refer to the norm and the numbers under $>$, $=$, $<$ in Table VII show how many times the reagent found the norm funnier, equally funny, or less funny than the comparisons.

Time differences ("errors")—that is, differences growing out of the fact that the norm was seen before or after the comparisons. When the sum of the results obtained where time and

the picture, which the reagent occasionally finds. In such cases he has been instructed to give his judgment on the picture and legend together.

TABLE VII.

<i>Reagent Br.</i>			<i>Reagent A.</i>			<i>Reagent M.</i>		
>	=	<	>	=	<	>	=	<
I - 37	7	6	I - 4	11	35	I - 45	13	42
II - 27	9	14	II - 3	12	35	II - 39	23	38
III - 30	11	9	III - 0	13	37	III - 12	23	65
IV - 38	7	5	IV - 2	12	36	IV - 23	20	57
132	34	34	9	48	143	119	79	202

space orders I and III are used (that is, when the norm is seen first), is compared with that obtained by adding the results where time and space orders II and IV are employed (that is, when the norm is seen second), an appreciable difference is found in the results of the reagents, which would not be the case if there were no time difference or other time influence present. The results indicate that M, and perhaps A, judged the norm funnier when seen after the comparisons, and Br, when seen before them. Examination of M's results for the two periods of four days each shows, however, that during the first four days she judged the norm funnier when seen before the comparison but that during the last four days her judgment was reversed. Taken as a whole, however, the numbers indicating a time difference are far too small, except in case of M, to be regarded as confirming the influence of one picture on another which was shown in Series I (1), b. The apparent absence of a true time difference, that is, that growing out of the fact that a picture is seen before or after another picture, may be due to the fact that it is covered by the presence of forms of time influence which affect the judgment of individual pictures;—time influences which not only do not affect the funniness of all the pictures in the same degree but not even in the same direction. The first of these time influences is that growing out of the change in the funniness of the norm from day to day. On the one hand, for example, reagents A and Br gave a higher judgment on the norm at the end, after having seen it 201 times, than at the beginning of the experiments. On the other hand reagent M found the norm in 77 instances funnier than the comparisons during the first four days and but in 40 instances funnier during the last four. Moreover, she gave a lower judgment on the norm on the tenth day at the close of the experiments than on the first day in the preliminary experiments made to obtain a norm.

The second form of time influence affecting the individual pictures, and hence doubtless the true time difference, is that which has to do with the alterations in the funniness which the comparisons undergo. This was shown by repeating with the

three reagents on the sixth day, with the comparisons, the experiments of the first, and tabulating the results. In Table VIII, Columns R, I, II, A, B, etc., have the same meaning as in Table I. The number in Column E indicates the number of times where no judgment was given. As in Series I the pictures, as a whole, had decreased in funniness to M, though

TABLE VIII.

R	I	II.				
		A	B	C	D	E
M.	49	5	5	23	17	
A.	46	22	10	7	6	5
Br.	34	5	38	5	2	

some few had increased. To Br they had decidedly increased in funniness as a whole. This result in case of Br is readily explained by the remarks of the reagent, which showed that the pictures were at first examined somewhat carelessly. This often resulted in the point of the joke not being thoroughly appreciated until after the pictures had been several times shown. In case of reagent A the scale of judgment has also changed though not in a definite direction. The following taken from A's introspections may throw light on these results:—He says that the judgments on the same picture may mean different things, being given at one time on one thing and at another on another; that there was sometimes a struggle in giving the judgment between the presentative and representative impression; that the legend had sometimes been read automatically and the picture stupidly stared at, no reproduction occurring; and where the two pictures were compared, that the judgment "equally funny" may mean pictures are alike and not equally funny.

The third time influence which the reagent's introspections show as having been present, and which our previous experiments would make us expect, was that growing out of the alteration in funniness of the norm during the same sitting.

In enumerating time influences there is a fourth one, also, which might be expected, and which arises from the fact that the comparisons (to exclude expectation, etc.,) were changed each day with respect to each other in the set.

Through always giving the same exposure to each picture the fifth time influence is eliminated.

This must, however, be borne in mind, namely: that while

the results represented on p. 41 by curves show that the time period affects the funniness of the pictures of a set in a general way—proportionally—, there are many exceptions; and this may become a matter of some importance when the same pictures are compared more than once, if conclusions are based upon a limited number of experiments.

With the hope of getting some further light on the reason for the varying results, as for example the decrease in funniness of the pictures, several of the reagents who had taken part in these experiments were asked, "Upon what do you base your judgment regarding the funniness of a picture?" B founds his judgments partly upon the physiological phenomena, the force, for example, he had to exert to keep from laughing. F, J and M base their judgments upon the degree of their desire to laugh. The statements of these four reagents remind one of Lange's remark that "emotion is nothing but the consciousness of all the organic phenomena which accompany it," and of James's that "the bodily changes follow directly the perception of the exciting fact, and our feeling of the changes is the emotion." With C the "feeling of surprise" and the "amount of absurdity" seem to be the determining elements. Br says he does not know upon what he based his judgments regarding the funniness of a picture. When asked whether it was on the amount of laughter he answers "by no means." A only goes so far as to say that his judgments are not entirely given on the physiological phenomena. It is noticeable that to the reagents B, F, J, M and C, who give their judgments largely on the tendency to laughter, or the feeling of surprise, the pictures become less funny from day to day.

Space differences ("errors")—the differences growing out of the position of the picture with respect to the reagent, that is, upon whether it was lying at his right or left. The results show that all the reagents find the norm somewhat funnier when lying at their right, or at least, that it is more frequently judged funnier when in that position. In the case of M, the difference is well marked as the numbers below, taken from Table, VII show:

<i>First four days.</i>					<i>Second four days.</i>				
	>	=	<			>	=	<	
I + II	58	13	29		I + II	26	23	51	
III + IV	21	19	60		III + IV	14	24	62	

The position does not make so great a difference in the last as in the first four days. The introspections of the reagent and the shorter time that elapsed before the giving of the judgments would seem to indicate that memory played a much greater part in the forming of the judgments during the last four ex-

periment days. Moreover, the time influences previously discussed in connection with the time difference must have had their influence here also with all the reagents.

The next series of experiments was devised for the purpose of finding out what the results would show when the time influences just mentioned were partially equalized. In order to get rid of the differences growing out of the fact that the norm had been seen much oftener than the comparison, just as many norms as comparisons were employed, that is, 50 of each. The time was also the same in each experiment. The experiments were conducted as follows: The norms and comparisons were used in pairs and to exclude the time difference arising from one being shown first, they were presented to the reagent simultaneously, the norms being laid at his left and the comparisons at his right on the first day. On the second day the position of the norms and comparisons in each pair was reversed but the pairs were used in the same order as on the first day. A fixation point was employed and the judgment terms used were the same as in the previous set of experiments. In the experiments the judgment was given on the picture at the reagent's right, but in the table, half of the judgments are transformed so that all the judgments refer to the pictures which were designated as the norms.

TABLE IX.

Judgments.	D. S.		A. A. M.		G. L.		F. G.		G. S.		E. S.		A. M.	
	L	R	L	R	L	R	L	R	L	R	L	R	L	R
Funnier (a, a ¹)	12	13	20	20	20	25	23	22	21	28	20	27	21	31
Less funny (b, b ¹)	27	29	26	29	16	16	23	15	19	18	30	20	20	15
=, ? , o (c, c ¹)	11	8	4	1	14	9	4	13	10	4	0	3	9	4

Under L in Table IX is given the number of judgments of that particular class when the norms were at the reagent's left. Under R the number of judgments when they were at his right.

If we indicate by a, b, c, the numerical results when the norm is on the reagent's left and the judgments "funnier," "less funny" and "=", respectively, and by a¹, b¹, c¹, the results when the norm is on his right and the judgments "funnier," etc., respectively, and if we assume that the change in funniness, due to the time influences previously mentioned, in the individual pictures of each set was proportional we should expect (1) (if no space differences exist) that if a < b, then a¹

would be $< b^1$ and the difference between a and b would be equal to that between a^1 and b^1 and *vice versa*. Also that if $a = b$, then $a^1 = b^1$.

We find that reagents D. S. and A. A. M. found the norms as a whole less funny than the comparisons in both positions, that is $a < b$ and $a^1 < b^1$, and that the reverse was true in case of reagents G. L., G. S., and A. M.; but E. S. and F. G. do not follow this formula nor is the difference between a and b equal to that between a^1 and b^1 in case of any of these reagents.

Again (2) we should expect—

$$a = a^1, b = b^1, c = c^1.$$

In no case is this actually so though the differences are small even for reagents E. S. and A. M. where they are largest.

To be certain that deviations from the formulæ given were due to space differences, and not to mere chance, another set of experiments was made with A. M. and E. S., whose results had shown the most marked differences. In this set 100 norms and comparisons were employed and the exposure was continued until the reagent had given his judgment.

TABLE X.

Judgments on norm.	E. S.		A. M.	
	L	R	L	R
Funnier (a, a^1)	33	47	39	47
Less funny (b, b^1)	58	34	56	48
$=, ?, o$ (c, c^1)	9	19	5	5

Here, as in the previous set of experiments, both reagents find the norms funnier when lying at their right; that is to say, *the position of a picture may make a difference in our estimate of its funniness.*

Causes of the space difference. The previous results which show that a picture is funnier when at my right I explained by a difference as regards clearness of vision in my right and left eye, and I naturally rather expected to find some difference in the eyes of the above reagents. An examination of the eyes of D. S. and A. A. M. and G. S. (where, of the three, the space difference was greatest) showed no difference in the two eyes as regards clearness of vision. The same was true in case of E. S. and G. L., but G. L. said he could read faster with the right eye and I noticed that the lid of E. S.'s left eye

slightly droops. Possibly F. G. and A. M. see more distinctly with the right eye. These slight differences do not seem to me, at least in the case of E. S. and A. M., to account satisfactorily for the space differences shown in these results.

Another explanation that occurs to one is partly physiological also. It is to explain the space difference as a time difference, that is, by supposing a reagent has a tendency to look first to the right, or to the left from the fact that muscular movements were easier or more natural in that direction. Such a tendency would be developed in reading one would suppose. Careful observation showed no decided tendency in any of the reagents except G. S., who himself spoke of having to make an effort not to look at the picture at his left first.

The third explanation that occurs to one is partly physiological and partly psychological. If the part of the picture that involved the point of the joke was at one side of the picture it would, in one of the two positions, be nearer the centre of the field of vision, in the focus of consciousness, and hence it would seem that it might more readily attract attention. E. S., for example, on several occasions when the norms were at the right, drew attention to the fact that she remembered her previous judgment and had changed it because something funny off at one side in one of the pictures was now more directly before her and more clearly seen than when the same picture was on her other side. E. S. also made remarks which point to factors at work which are more purely psychological in their nature. She said, for example, "Those horses are looking towards me to-day and I can see them better and that makes the picture funnier." Of an alligator with its head to the left she said, when the picture was on her right, "I can't see its tail to-day and that makes it look longer and much funnier." Even if such causes as those just mentioned, which are partly psychological in their nature, explain the space difference, it is evident, in the light of this investigation, that even then the space error might be quite different with the same set of pictures in the case of different reagents.

The space difference may be explained as a time difference in still another way. We may suppose that a second seeing of both the pictures leads to a better understanding of them and to an alteration in the judgment or even that our original supposition was not correct and that while both pictures have lost or gained in funniness one has lost or gained more than the other. The possibility of this being so has been shown by the results in Series 1 (1), a (See p. 40) but the distribution of the like, doubtful and zero judgments, and of the judgments where the difference in funniness was most marked, scarcely confirms

this idea though future experimentation may show it to be so. Whatever may be the cause, the point here is to show, that *space differences (even in the same picture) may exist and that this should be taken into consideration when pictures are examined alone or together.*

An experiment made in connection with Series 4 shows how subtle are the influences of position on the comic. It came out accidentally and quite involuntarily on my part in connection with examining the drawings from which Slide 6 (Plate III) was made that the position of I and II with respect to each other affected the funniness of the picture as a whole. To me the combination seemed more comic when II was at the right. I attribute it to the fact that as my right eye is stronger I was able to see the laughing boys better and thus experienced the additional amusement which came from their laughing faces. My opinion that the position of these pictures with respect to each other is not a matter of indifference was confirmed by the opinions of others to whom I showed them.

The above observation led me while making the mass experiments of Series 4 to reverse Slides 5 and 6 of Plate III, thus not only changing the position of those who are laughing from the observer's right to left, but the direction in which all the figures were looking, and asking the students, if they observed any difference, to state in which position the slide seemed funnier. The results given in Table XI show that the position of the parts of the slides made a difference in their funniness to many students.

TABLE XI.

SLIDE 5.		SLIDE 6.	
III at re- gent's right.	III at re- agent's left.	II at re- agent's right.	II at re- agents left.
22	68	9	38

The introspections confirm what was surmised from the previous introspections; namely, that the direction in which the figures are looking or moving may influence the funniness. In these two cases, however, all the figures are changed as to direction of looking and one would suppose from this,—and this is confirmed by the introspections recorded,—that the difference in funniness here arises mainly out of the relative positions occupied by the laughing faces in the two pictures. While in-

sisting that the one or the other position of the two pictures with respect to each other was funnier, two-thirds of the reagents could give no reason for their opinion. The following reasons were taken from those given by the other third. *On Slide 5*: "Laughing boy at left is seen first," "crying boy is funnier; and when he is at left, I laughed at once," "more natural sequence of events from happiness to sadness," "laughing boy at right is the climax of a series," "crying boy at right illustrates pride having a fall," "crying boy at right suggests a story in which the boy receives punishment for taking the hat," "from my seat could see the laughing boy better when he was at right." *On Slide 6*: "Laughing boys at left prepare one for a joke," "suggests that race becomes funnier as it proceeds," "more natural sequence of events; boys looked and then laughed," "boys first surprised and then amused," "sober boys at right gave an anticlimax," "sober faces at right suggests boys grow sober as they see how the man sticks to his work," "I thought of the old man as making a 'home run' and the sympathy of the boys with him."

Expectation as an influencing factor. In connection with this series of experiments an observation was first made which has been occasionally made in others. During the experiments with A the experimenter so turned the leaves on which the pictures were pasted that a blank page was shown to the reagent who immediately laughed. Whatever may be the cause of the phenomena mentioned (that is, theories of Hobbes, Spencer, Kant, Lipps, etc., seem to explain it partially), allied phenomena must sometimes affect the judgments given regarding funniness.

Series 3. The Method of Averages (suggested by method of "average error") was employed: (1) To examine individual differences regarding the funniness of a given set of pictures. (2) To ascertain whether a picture seen just before another picture affects our judgment of the funniness of the latter. (3) To investigate the relation of smiling and laughing to the judgment of the comic. *Material.* Three sets of comic pictures each made up of twenty-five pictures having a short legend. All the judgments recorded in the tables were those made upon these pictures. Two sets of fore-pictures each made up of twenty-five sad pictures. One of these sets contained reproductions of the work of Michael Angelo, Raphael, Andrea Del Sarto, Rubens, Van Dyck, Dürer, Böcklin, etc., seven of which represented the crucifixion, one Christ before Pilate, four the bearing of the cross, seven the Pietà (three of these were different reproductions of Michael Angelo's Pietà), four the interment of Christ, one the Mater Dolorosa and one the Last Judgment. In the second set of fore-pictures there were four-

teen reproductions of pictures by Millet representing peasant life, Dürer's *Melancholia*, Böcklin's *Medusa*, Bouguereau's *The First Mourner*, Sargent's *Prophets*—Zephaniah, Joel, etc., Gabriel Max's *Katto Emerick*, three different reproductions of the *Laocoön*, two of the *Dying Gladiator* and one of *Michael Angelo's Slave*. The three other sets of fore-pictures used in investigating the effect of a picture previously seen upon the judgment of the picture immediately following it, were made up of comic pictures cut from the periodicals already mentioned. *Reagents.* Messrs. Borouhgs (R. B.), Perry (P), Russell (I. R.), Stork (V. S.), and Miss Holmes (H).

Method. In (1) the pictures were laid in turn before the reagent and he was asked to give his judgment using the terms, "very funny" (recorded as 3), "moderately funny" (recorded as 2), "slightly funny" (recorded as 1), "cannot decide whether funny or not" (recorded as 0), "not funny" (also recorded as 0). He was also told to add the words "plus" and "minus" if he felt the need of differentiating further. After his judgment had been made he was asked to report whether he had felt any tendency to smile or laugh. A slight tendency (S) was recorded as 1, a decided tendency (S) as 2, a slight tendency to laugh (L) was recorded as 3, and a decided tendency (L) as 4. If the reagent was doubtful, or felt no such tendency, 0 was recorded.

In (2) the experiments were made as in (1) except that before each comic picture, a picture of one of the sad sets was shown for twenty seconds and the reagent was asked, in looking at it, to put himself into a mood in harmony with what was represented as far as he could. The same thing was done in the experiments where the comic fore-pictures were employed, except that the exposure was but for fifteen seconds as one of the reagents complained that the climax of the effect of the comic picture was nearly always reached before twenty seconds had expired.

In Table XII, below, Column I gives the results for the judgments regarding the funniness of the pictures and II the corresponding report regarding the tendency to smile and laugh. Under I *a* are the judgments on funniness and under II *a* the report on smiling and laughing the first time the comic pictures were seen and when none of the fore-pictures were used. Under I *b* and II *b* the same thing is given where the fore-pictures were sad and under I *c* and II *c* where they were comic. These three sets of experiments came on three successive days and with one exception at the same hour. On the fourth day the experiments of the first day were repeated and the results are found under I *d* and II *d*.

The numerical results found in the columns of this table

TABLE XII.

Reagents.	Pictures.	I.				II.			
		a	b	c	d	a	b	c	d
R. B.	Set 1	1.28 .90	.64 .72	1.44 .62	1.08 .67	1.00 .64	.56 .56	.92 .22	.56 .49
H.	"	1.36 .51	.96 .23	.50-.60 .50-.48	.40 .48	1.12 .73	.68 .60	.24-.32 .36-.46	.12 .21
P.	"	.92 .29	.36 .46	.64 .46	.68 .44	1.00 .40	.28 .40	.52 .50	.56 .49
V. S.	"	1.48 .66	1.60 .48	1.68 .44	1.60 .48	1.12 .67	.76 .63	.98 .43	1.16 .70
I. R.	"	1.68 .62				1.32 .89			
Average.	"	1.34 .20	.89 .39	.98 .47	.94 .40	1.11 .09	.57 .15	.60 .28	.60 .28
R. B.	Set 2	1.56 .70	.48 .54	.92 .44	.72 .58	1.20 .64	.44 .49	.76 .36	.50 .49
I. R.	"	1.64 .78				1.60 .98			
H.	Set 3	1.16 .42	1.52 .62			1.08 .60	1.32 .76		

were obtained as follows: The judgments made were recorded in the numbers just given in connection with the judgment categories. At the close of a set of experiments the numbers recorded in connection with smiling and laughing and with the degree of funniness were added separately, no note being taken of the plus and minus signs, and the sums divided by 25, the whole number of experiments. Each average is accompanied by its mean variation. At the foot of the columns where Set 1 was used is given the average with the mean variation for all the reagents who used that set. Naturally these numbers, especially where they contained decimals, are not correlatives of particular reports on sensation or feeling. Still it is true that the number 1, with a very small mean variation, shows that the pictures as a whole were judged "slightly funny." With a large mean variation, on the other hand, that the pictures were very unlike as regards funniness. An average 1 as compared with an average 3 (both having correspondingly small mean variations) would show that the pictures as a whole were considered much funnier in the second case.

Table XIII contains the results of the same series of experi-

ments which are given in Table XII but differently arranged, that is, arranged as in Table I,—I, A, B, C, D, having the same meaning as in that table. I *a*, I *b*, etc., have the same meaning as in Table XII. This table is given to show, whenever a comparison between the two is possible, that conclusions based upon the less cumbersome table of averages can be relied upon.

Discussion of Results: (1) The mean variation for the average of Column *a* in Table XII shows that the reagents do not agree regarding the funniness of the pictures in Set 1. I. R. (who is the editor of the *Chaparral* and who thought he would be very much less susceptible to the funniness of comic pictures than others) found the pictures of Set 1 funniest and P found them least funny. Table XII also shows that to R. B. Set 2 was funnier than Set 1, and that in case of I. R. the opposite was true. The larger proportional mean variation in case of R. B. than in case of H shows that to the latter all the pictures were more nearly alike as regards degree of funniness.

(2) I *d* and II *d* when compared with I *a* and II *a*, Tables XII and XIII, show that in the repeated seeing of the pictures their funniness decreased to all the reagents except V. S.

(3) It is evident from Columns *b* in both Tables, except in case of V. S., that after looking at sad pictures, the comic pictures did not seem as funny. The very large mean variations in case of reagents R. B. and P. show that the sad pictures used differed greatly in effectiveness. In these experiments one reagent spoke of how much the element of naturalness added to the effectiveness of the pictures. Perhaps it was the lack of naturalness which made the two pictures of the crucifixion by Ulrich Apt and Altdorfer have almost the opposite effect from that of the other sad pictures, and possibly it was this, also, which gave the effectiveness to the *Pietà* by Böcklin. Not only the content of the picture but the nature of the print itself is also important as regards effectiveness. One of the reagents remarked, for example, that the photographs used were much more effective than the half-tones.

In the course of these experiments one of the reagents said that she could make the sad pictures affect her by holding "her breath" and "breathing deeply" or by using her "imagination." She added that unless she did one or the other, or unless there was "a suffering face" or "some decided indication of physical suffering," she felt nothing while looking at the sad pictures.

(4) The tables show, except in case of reagent H, that when the sad fore-pictures are replaced by comic fore-pictures, the funniness of the comic pictures is partially or wholly renewed. H compared the funniness of the new and old comic pictures,

and said it was much less in case of the latter, and had not a more satisfactory explanation been at hand possibly the consciousness of contrast might have been considered as offering a possible explanation of the variation observed in the case of this reagent. The fact is, that in case of reagent H, the effect of both the sad and comic fore-pictures is entirely covered by the loss in funniness which comes from the repeated seeing of the comic pictures. As Table XII shows, two sets of comic fore-pictures were tried with H in connection with the pictures of Set 1; the second set she reported much funnier than the first, but the results are only very slightly higher.

To test this matter further a new set of comic pictures (Set 3) was taken up with H, and the sad fore-pictures of Set 2 were inserted before the comic pictures were first exposed to her. These were then removed, and the comic pictures exposed by themselves. Where with Set 1 of the comic pictures the sad fore-pictures had seemed to make the comic pictures less funny, with Set 3 of the comic pictures the opposite was true. The results are readily comprehensible when we examine Columns *d* in both Tables and see how enormously the pictures decreased in funniness in repeated exposures to this reagent.

It should be noted that the experimenter as well as the reagents often observed what they termed a "hold-over" smile in looking at the comic pictures after the comic fore-picture had been removed. It may be said in passing that these "hold-over" smiles are also occasionally observed on the faces of the reagents in looking at any set of comic pictures, and in the light of the results obtained in the experiments of Series 1 and in using the questionnaire this must decidedly affect the results.

(5) A comparative glance at the results of both Tables will confirm the remark of the reagent who said that the sad fore-pictures were more effective than the comic. One can also readily believe from the results that the comic pictures, as one of the reagents said, came as a great relief after the sad fore-pictures.

(6) The Tables show also that the degree of influence of both the sad and comic fore-sets of pictures depends upon the individual. For example, as regards the sad fore-pictures of Set 1, P (Protestant) was most affected, and that R. B. (Catholic) comes next. Both tables show that V. S. (Jew) felt much less like laughing at the comic picture when he had seen a sad picture just before it, but if we rest our opinion entirely on the judgments he gave regarding their funniness we must say that he finds the comic pictures when succeeding the sad pictures slightly funnier. It should be added, however, that his judgment on the first few such pictures was lower than when the sad pictures were not present, and that he com-

plained of finding it difficult to get himself out of the mental attitude of the sad pictures. In case of the comic pictures, the results in the tables show that R. B. and P. were also most affected and S. V. least. Have we not perhaps here a method of penetrating into the emotional characteristics of individuals? These results confirm one in the opinion which one forms in becoming acquainted with these three men, namely that S is more governed by his head than are the other two reagents.

(7) An examination of the results shows that the tendency to laugh and smile takes the same general course as do the judgments. If not directly connected, the two run parallel, so to speak, and in general, opinions regarding the presence or absence of the comic impression may be based upon either.

One of the reagents (H) complained of the difficulty of remembering whether she had felt like smiling or laughing, and this led to the experimenter's recording the smile and laugh with the reagent I. R., with whom this set of experiments were still to be made. The same symbols were used as before and the judgment of the experimenter regarding the smiling and laughing of the reagent was always formed and sometimes recorded before the reagent had given his. The results are as follows:

	o	?	S	S	L	L
Judgment of experimenter	18-3-	7-0-	16-6.			
Judgment of reagent	11-0-	18-3-	16-2.			

As we should expect, the number of cases where no smile or laugh was recorded is greater in the case of the experimenter. Doubtless, training in the observing of expression, and a knowledge of the reagent's face, especially if its mobility is marked, would bring the two records somewhat nearer together. It seems to the experimenter from her experience in these experiments that we have in such experiments a means of increasing our knowledge of the relation between feeling or thought and physical expression in the same and different individuals.

The effect of a sad picture and of a comic picture upon the funniness of a comic picture immediately following was also investigated in connection with the experiments of Series 4, a mass experiment in which the Method of Choice was employed. A comic picture called the Elephant's Revenge was thrown upon the screen for the reagents to examine. It was then replaced by Bouguereau's The First Mourners. The comic picture was then again shown and the reagents reported whether it was funny or less funny than when first seen. The same experiment was repeated except that a comic picture, The Donkey and the Bee, was substituted for The First Mourners.

The results given in Table XIV, below, confirm those of the

previous experiments in that they show that the fore-picture affects the degree of funniness of the picture succeeding it; but they do not show as a whole, as did the preceding experiments, that sad fore-pictures tend to make the comic pictures following immediately after less funny, or that comic fore-pictures have the opposite effect.

TABLE XIV.

No. of reagents finding comic picture funnier after the sad fore-picture.	No. of reagents finding comic picture less funny after the sad fore-picture.	No. of reagents finding comic picture funnier after the comic fore-picture.	No. of reagents finding comic picture less funny after the comic fore-picture.
41	39	22	12

The effect of music on the funniness of a picture was also similarly investigated with these reagents. A comic picture was shown and the reagents noted the funniness. Sad or sacred music was then played and the reagent recorded whether this increased or decreased the funniness of the picture. The same thing was repeated except that lively or comic music was substituted for the sad or sacred music. The results are recorded in Table XV, below. Slide 9 represented some boys preparing to roll a big snowball down a hill upon a pig watching them; Slide 10 represented a man asleep with his mouth open into which a spider suspended by its thread was about to drop; Slide 13 was the "Kemble picture" represented in Plate VI. With Slide 9, "Wayside Chapel," "Polly Wolly Doodle," and "O where is My Little Dog Gone," were played. With Slide 10, "Old Kentucky Home," and "Dashing through the Snow." With Slide 13, "Nearer my God to Thee," and "Yankee Doodle."

From these results it would seem that both sad or sacred and light music may greatly increase the funniness of a picture but that they have less power to decrease its funniness.

The investigation was carried still further under conditions that were considered more favorable for arriving at reliable results. Eight of the more advanced students were invited to participate in this experiment. Eight pictures were examined by these reagents, four while sad or sacred music was played (Chopin's "Funeral March," "One Sweetly Solemn Thought," "Prelude to the Organ," "Funeral March") and four while lively music was played ("Tarantelle," "Christmas Polka," "Scotch Song," "Dixie Land"). The sad and sacred music, except in two or three cases where it had no effect, decreased

TABLE XV.

SLIDE 9.			SLIDE 10.			SLIDE 13.		
After the Sacred Music.		After the Lighter Music.	After the Sad Music.		After the Lighter Music.	After the Sacred Music.		After the Lighter Music.
No. re- porting picture fun- nier.	No. re- porting picture fun- nier.	No. re- porting picture less funny.	No. re- porting picture less funny.	No. re- porting picture less funny.	No. re- porting picture less funny.	No. re- porting picture less funny.	No. re- porting picture less funny.	No. re- porting picture less funny.
96	8	56	47	21	2	25	16	70
		5						2

the funniness of the pictures; the lively music had the opposite effect.

The leaves of Kemble's book called the "Pickaninnies" were then turned for the observers to examine the pictures. Half of these pictures were then shown while sad or sacred music was played and half while light music was played. All except one reagent recorded that the sad music lessened the funniness of the pictures and the light music increased it, and that this last was especially true where any movement was represented. One reagent said in noting the effect of light music, "they cake walk and go through all sorts of movements." To summarize: In view of all these results, it is evident that a sad fore-picture or sad or solemn music may decrease or increase the funniness of a comic picture. The same is true of a comic picture and of light music. I suspect, however, from an examination of the reports in connection with the characteristics of those who gave them, that where the reagents fully entered into the spirit (perhaps I should say feeling) of the music and fore-pictures used, the sad or solemn music and sad fore-pictures decreased, and the light music and comic fore-pictures increased, the funniness of the comic pictures in connection with which they were employed. I have gone into this subject somewhat at length in this preliminary work because of the theoretical interest of "contrast" in connection with theories of the comic and of the use of "contrast" in dramas, etc., to heighten the effect. In the light of these results it is evident at once that "contrast" alone cannot fully explain the comic effect. From the practical standpoint they also show that "contrast" must be introduced with great care or it will defeat its ends.

Series 4. The Method of Choice as a Mass Experiment.

Object: (1) *To ascertain the influence of smiling and sober faces upon the comic impression.*

Apparatus, Material and Method. Stereopticon and the following slides: *Slide 1* (Plate I) 2 sets of pictures (these pictures and the ones from which slides 3 and 5 were made were drawn by one of my students, Mr. R. Borough). Set 1 containing a set of 6 of Da Vinci's smiling faces differing only in the amount of laughter as expressed by variations in the amount of the stretching of the mouth. Set 2, a similar set differing only in the degree of dolefulness represented in a similar way. Set 2 was covered, and Set 1 was exposed for the observers to record the number of the face found funniest. The same thing was repeated with set 2. Both sets were then simultaneously exposed and the observers noted the set which as a whole was found funnier. The number of observers finding face I, II, etc., funniest under each set is recorded under I, II, etc., in Table XVI under Slide 1. In the case of each of the slides

following, a similar record is given in the same table. *Slide 2* (Plate I): Taken from *Fliegende Blätter*, June, 1897; observers recorded whether I or II was funnier. *Slide 3* (Plate II): As will be seen, the five pictures differ only in the man's mouth. Regents were requested to note (1) whether I, II or III was funniest; (2) whether I, IV or V was funniest; (3) whether II or IV was funnier; (4) whether III or V was funnier. *Slide 4* (Plate II): (Appeared in *Sis Hopkins*, 1903. Reproduced through the courtesy of *The Judge Company*.) Observers noted (1) whether I or II was funnier; (2) whether II, III or IV was funniest. *Slide 5* (Plate III): (1) whether I or II was funnier; (2) whether I or III was funnier; (3) whether II or III was funnier. *Slide 6* (Plate III): (By courtesy of *Puck*, Keppler and Schwarzmann, Proprietors.) Mr. Borough made two large copies of this picture. One was like the original but in the other the boys' mouths were made to have a sober expression. From these two drawings the slide was made. Regents recorded whether I or II was funnier.

Reagents. Stanford students (119) attending lectures on the Psychology of the Social Relations.

Results. The sum of the judgments under each of the experiments just outlined, as well as of those of the experiments recorded in Tables XIV and XV, does not equal 119. This is due to the fact that in some cases the reagents said they had no opinion, in others that the judgment was recorded in such a way as to be incomprehensible, and in still others that no judgment was recorded and nothing was said.

TABLE XVI.

SLIDE 1.															
Set 1.						Set 2.						Set 1 and 2.			
I	II	III	IV	V	VI	I	II	III	IV	V	VI	1	2		
3	4	1	6	52	46	5	7	9	18	32	19	60	25		
SLIDE 2.		SLIDE 3.										SLIDE 4.			
I	II	I	II	III	I	IV	V	II	IV	III	V	I	II	II	IV
28	82	3	40	61	9	29	41	72	22	83	19	32	85	19	98
SLIDE 5.						SLIDE 6.									
I	II	I	III	II	III	I	II								
17	65	12	81	40	54	12	87								

Conclusions based on the above tables.

a. Within certain limits the broadness of the smile of a smiling face increases its funniness. The same is true of a doleful face. (See results under Slide 1.)

b. A smiling face is more provocative of fun than is a doleful one. (Slide 1, Compare results under Set 1 and 2.) That is, we prefer, in opposition to Hobbes's theory, on the whole, to laugh with others rather than at them. (See also results under Slides 2, 3, 4, 5, 6.)

c. The presence of smiling and doleful faces helps the funniness of a picture more than those that are expressionless. (See results for Slides 3, 5, 6.) Moreover, the funniness is increased by increasing the amount of smiling and of dolefulness. (See results for Slides 3, 4.)

d. The presence of a doleful expression decreases the number of judgments that one of a set of pictures is funny. This is seen by comparing the judgments in case of all the slides. For example, in case of Set 1 of Slide 1, the whole number of judgments that the pictures are funny is 112, while on Set 2 it is but 90.

It will be readily seen that the above conclusions should not be ignored in selecting comic pictures to be compared.

2. *To ascertain the effect of the size of a picture upon the comic impression.*

It seemed to me in comparing the pictures of Series *b* that their size had something to do with making one picture seem funnier than another. This opinion was confirmed by having, by means of the camera lucida, a more enlarged drawing made of the picture number II in Slide 6 than that used in making the slide, and asking people which drawing was the funnier. The majority of those questioned found the larger picture much funnier. An enlarged drawing of the picture on Plate VII (taken from *Fliegende Blätter*) also brought similar answers.

At the close of the mass experiments just described, Slide 7 (Plate IV) containing a smiling Da Vinci face in six different sizes was shown to the reagents. Fifty-four of them did not find the faces on the slide funny. The judgments of the remaining sixty-five are tabulated below, under I, II, III, etc., being given the number of persons who found that particular face funniest.

I.	II.	III.	IV.	V.
4	5	20	14	22

Barring III, where the stereopticon brought out a peculiarly "funny turn of expression," as one reagent expressed it, which was due to the drawing, the funniness increased with the size. At various times, since, Slide 8 (Plate IV¹), 11 (Kemble's Frogville Meeting-house), and 12 (Kemble's "I doan' wan' no mo' bufdays fo' a whole year") have been thrown on the screen and people questioned in the case of each slide as to whether the larger or smaller picture was the funnier. Those questioned, as a whole, found the larger picture funnier. Unfortunately in the making of the slide itself, as well as in the projecting of the picture on the screen, there is great difficulty in getting the two pictures of exactly the same brightness; and for this reason the pictures differ not alone in size but also in distinctness. It therefore seemed desirable to try another method.

In this second method a convex lens—an ordinary reading glass—was employed. The glass was laid flat upon the picture and then raised by steps to the point where the latter was largest and still distinct. Several hundred pictures were examined and twenty or more reagents took part. Whether made up of a few lines or of very minute details the pictures were almost without exception found funnier when large. Many of these reagents also compared the pictures when reflected in a mirror from different distances and when placed at different distances from them but sufficiently near to be clearly seen. It was due to previous habit doubtless that, in general, the increase and decrease of size thus effected did not alter the degree of funniness. Occasionally a reagent reported that a picture farther from the mirror and at a greater distance was funnier. When asked why, he replied that it seemed to have greater depth and he felt more like a "looker on."

In view of these results it is evident that a larger picture has the greater probability of being judged funnier, and that in selecting pictures for comparison, pictures of the same size should be chosen.

If one wishes to examine a striking illustration of the above fact, one has but to compare the cartoons which appear in the *American Monthly Review of Reviews* and in other magazines with the larger originals. Indeed, is not Gibson's power enhanced by the fact that his pictures are so often larger than average pictures of the sort?

Several explanations occur to one as to why, other things being equal, large pictures are funnier. One is that what is presented is perceived with greater ease and distinctness,

¹This picture appeared in *Sis Hopkins*, 1903. Reproduced through the courtesy of *The Judge Company*.

another is that a larger picture allows more time for the renewal of fun in the moving of the eye from point to point (see Series 1, (1) (a) and another that any imitative movements present have greater extent (see p. 91).

(3) To find the effect of movement upon the comic impression. An interesting observation was made in connection with the experiments just described. The reagents frequently reported that, aside from the increase of size, the movement itself, both up and down, increased the funniness. A series of 50 pictures was tried with six different reagents. The reading glass was employed as before and the reagent moved it in various directions in examining the picture. There were exceptions, but as a whole the movement in one or more directions was immediately reported as adding funniness to the pictures. Various reasons were assigned. One reagent said it was due to the series of "snap shots" or of "surprises" that the movement gave. In general, the movement was reported as giving life and reality to the picture, that is, that the movement which was in harmony with the probable direction of movement of any portion of the picture increased its funniness. If, for example, the movement of a person or animal, or even of an object, through the wind or any other cause, as the falling of water down an inclined plane, was towards the reagent, it was the upward movement of the glass that made the picture seem funnier; and if the opposite conditions were present it was the downward. A striking illustration of the movements in opposite directions increasing the funniness, and one often present, is that in which the persons represented in the picture seem during the upward movement to open their mouths (and even their eyes) and during the downward to close them, as if talking. It was also reported in this connection that the movement made the characters in a picture "really smile and laugh." Such report was more frequent, as one would expect, where the face was so represented as to make smiling or laughing a probability. One reagent remarked, after giving her report, with a laugh, as had several others under similar conditions, that the laugh was "contagious." Again, where people or animals are fighting, the movements downward made them approach, and upward, recede from each other; and this also added greatly to the funniness. The lateral movements of the glass have also the effect of increasing the funniness, for reasons similar, doubtless, to those just given.

Series 5. The Method of Gradual Variation.

Object. To ascertain whether there is, in case of a single individual or of individuals as a whole, any particular degree of exaggeration which makes a given thing most comical.

Reagents. Ten students who had worked in the psychologi-

cal laboratory one semester or more. *Material.* The following pictures: (1) An extension dog—Dachshund (Fig. 1, Plate V, $\frac{1}{4}$ size of the original drawing). This cut and the others may be used, as were the original drawings, by removing the page and then dividing the drawings into two parts by cutting along the line A B. The parts thus separated can then be moved over each other and by so doing the dog, hat, and man may be made any length desired. (2) A man with extension legs (Fig. 2, Plate V, $\frac{1}{3}$ size used). (3) A child with extension hat (Fig. 3, Plate V, $\frac{1}{7}$ size of the original drawing). This drawing and the one first mentioned was made by Mr. R. Borough. The second one mentioned was made by another of my students, Mr. I. Ackermann.

Method. (1) The dog was made as short as possible and laid on the table before the reagent, no directions being given as to the mode of holding the head or looking at the picture. It was then lengthened until the reagent thought it of normal or natural length. This point was noted. The dog was then made full length and afterwards shortened to the point where the reagent considered it normal. This point was also noted and the experiments were then repeated. The average of the four measurements expressed in centimeters with each of the ten reagents together with the mean variation is found in I, under 1, in Table XVII below. (2) The dog was made as short as possible and then lengthened to the point between this point and the normal point (if the reagents found any well defined point), where the dog was funnier than when of any other intermediate lengths. Starting with the normal length the experiment was then repeated in the reverse direction. As before, four measurements were made. Each reagent found one length decidedly funnier than the other lengths, and the average length for the ten reagents together with the mean variation is recorded in I, under 2, in the table. (3) The dog was lengthened from the normal point to the point where reagent found it funniest. As before, the direction was then reversed and the experiment was repeated. Here, also, each of the reagents found a length of the dog which was decidedly funnier than any other, and the average length for the ten reagents and the mean variation is put down in the table in I, under 3. At the close of this experiment the reagent was asked whether he found the dog funnier when longer or shorter than the normal and his answer noted. (4) The results in I, under 4 in the table, were obtained by lengthening and shortening the dog in the manner previously described and by asking the reagents to state in each case when it had reached a length where it could no longer be comfortably seen, or conversely not seen, as a whole. The taking of this measurement

was suggested by the introspections of the reagents. Several said they could "not take the dog in" as a whole beyond a certain point. One reagent asked over and over in connection with the adjustable hat how much of the picture was to be included "at a time." Another, whether he was to keep his head still during the experiment. (5) The experiment recorded under 5 in the table was conducted as before except that the reagent was asked to say at what point the dog no longer seemed, or conversely did seem, to be a dog. Several had said that beyond a given point the dog did "not look like a dog" but "a log." The hat beyond a certain point was said to look like "a stove pipe," "smoke stack," etc.

At the close of the above experiments the dog was lengthened and shortened with different rates of speed and the reagent was asked whether this movement in any way affected its funniness. If he answered in the affirmative, inquiry was also made to ascertain whether the direction, rapidity or the suddenness of arrest of the movement made any difference.

The above measurements were also taken and recorded in case of the man with the extension legs and the child with the extension hat.

The results seemed to make it desirable to obtain more data along this line and the following mass experiment was made. The drawing from which Fig. 1, Plate V was made was drawn on a waxed plate and reproduced by the mimeograph. A copy of this drawing was handed to each of the students attending lectures on the Psychology of the Social Relations, in connection with the lecture on the Psychology of Advertising, with the following directions: (1) Lengthen and shorten the dog as much as possible several times and then record the point where it looks natural. Is the dog funny at this point? (2) Make the dog shorter than natural and record point where it is funniest (if there is such a point). (3) Make the dog longer than natural and write down point where it is funniest (if there is such a point). Lengthen and shorten dog as much as possible several times before answering the above questions. (4) Do you find that the dog is funnier when longer or shorter than its natural length? (5) Lengthen and shorten dog. Is the movement funny? If so, is it equally funny in both directions? If not, in which direction is it funnier? (6) Add any introspections you make during the experiment.

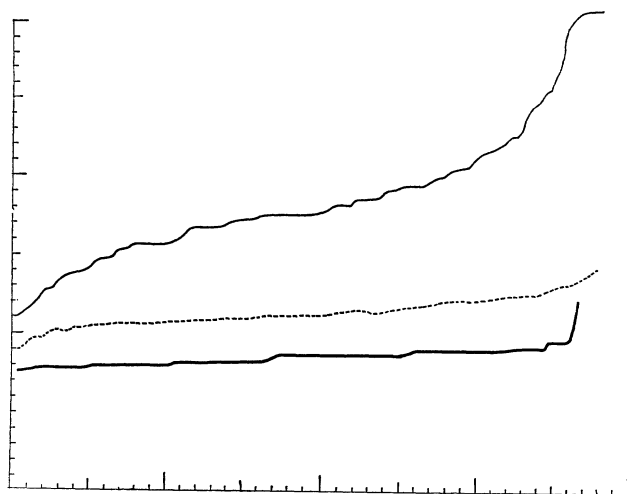
One hundred and twelve students handed in measurements. Ten of the students of this class also made a similar report for points (1) and (3) in the case of the hat and man. The results of these experiments are given in II in the table, the numbers (centimeters) indicating the average lengths of the dog, the

legs of the extension man and the heights of the extension hat and their mean variations.

TABLE XVII.

	Extension dog.					Extension man.					Extension hat.				
	I	2	3	4	5	I	2	3	4	5	I	2	3	4	5
I.	11.0	8.8	14.9	12.6	15.5	8.0	5.4	11.0	10.1	11.7	4.4	2.1	8.1	10.1	10.2
	.7	.2	1.3	.8	.5	.5	.2	.6	.2	1.4	.4	.4	1.2	2.7	2.7
II.	11.4	8.4	18.6			8.1		11.3			4.6		7.1		
	.9	.5	3.2			.7		.5			.7		1.5		

In the curve below, the above results are shown in detail in one case—that of the extension dog, where one hundred and twelve reagents took part. The heavy line is for the dog shorter than the normal, the dotted line for the normal dog, and the light line for the dog longer than the normal.



CURVE IV.

The ordinates represent the lengths of the dog as chosen by each of the 112 reagents, each division corresponding to one centimeter. These chosen lengths are arranged on the abscissa in order of magnitude, each division corresponding to three choices.

Results (1) The results show that the reagents agree fairly well in regard to the normal length.

(2) The reagents all find a point less than the normal which is decidedly funnier than other points though they do not agree in regard to the particular length as well as in the case of the normal. The length less than the normal seems in general to be quite as funny as the one longer than the normal though four reagents did not find it at all funny. About half the reagents thought it funnier because they were tired, they said, of the greater exaggeration.

(3) As regards the length greater than the normal which is funniest:—In order to save space, the result for each reagent is not given by itself, but the small mean variation in the case of the four measurements under each head, and also the feeling of certainty reported by the reagent in giving a judgment, which was in no case omitted, show that here also each individual had a decided preference as regards the degree of exaggeration. The size of the mean variation in the experiment in which the one hundred and twelve reagents took part seems to point to decided differences in the individuals regarding the length of the dog which is most comical, though it should be taken into consideration that these experiments were made in the lecture room where the only support was the reagent's lap. This large variation doubtless grows, partly at least, out of the fact that some few of the reagents find the dog funniest when as long as possible. The questioning of several such reagents, however, brought out the fact that there was another length, not far from the general average, which was also "very funny."

As regards the reason why so many reagents agree fairly well regarding the length between the normal and the extreme length which is funniest, not only in case of the dog but in case of the hat and man, one can believe from a comparison of the results in 3 with those in 4 and 5, that it is connected in some way with the inability of the eye, or perhaps of the mind,—since the twenty reagents, with whom all three sets of experiments were made, did not materially change their judgments when the objects were placed at distances of one meter and more,—to take in the whole object comfortably at a glance or to grasp it as a unit. On the other hand the introspections of the reagents concerned show that to the associations aroused is to be attributed the fact that the dog, hat, and man when exaggerated as much as possible, are so "very funny." One reagent said laughingly of the dog, for example, "I am expecting to see it break in two;" another, "I wished to see how long it could get." Of the hat, another said with a smile, "It looks like a stove pipe now."

The advantage of this method is still further seen in that it makes one aware that there are not only the primary fun producing lengths just mentioned but certain secondary ones.

The reagents remarked during the process of lengthening and shortening the dog, man, and hat, that certain lengths were "a little funnier" than others. Though they usually could not tell why, it is probably often due both to vacillations in attention and to partially aroused associations. The presence of such influencing associations is clearly seen in case of the hat. One reagent says, for example, "Now it is a John Bull hat; the fun has nothing to do with the child but with the funny pictures I have seen of John Bull;" another, "Now it is a French plug" or, "Now it is an old-fashioned Panama or Grandpa's plug," "Now it is like a hat one sees" in "the circus" or "in advertising," etc. Moreover, there is doubtless sometimes a change in interest from moment to moment; for example, one reagent said at one point, "It is the boy and hat I am thinking of now;" at another, "It is the hat," etc.

Movement. Ninety-four per cent. of the reagents report that movement increases the funniness of the object. In general it is the more rapid movement which is more effective. Sudden stops also often increase the funniness. The reagents are about evenly divided as to the direction of movement which most increases the funniness. The reports of one reagent also suggested that the direction of movement with respect to the normal point was the important thing. He thought going from normal was funny and towards it not.

It is probable that the increase in the comic impression brought about here through movement is due largely to the associations thus aroused. It was said in connection with these experiments, "In growing shorter it (the hat) makes me think of the smashing in of the plugs;" "The man seems to be kicking;" "The child's expression seems to change during the movement," "The child is laughing at me now and seems to be enjoying this," etc.

The results of the above experiment show that we have in the Method of Gradual Variation a valuable means for investigating the comic impression growing out of the exaggeration which is so often present in the comic pictures of the present time.

Series 6. The Method of Expression.

To ascertain the peculiarities of the pneumographic and sphygmographic curves when the stimuli were comic pictures. (Messrs Gibbs and Yoshimi acted as experimenters.)

Apparatus. Sumner pneumograph, Marey tambour, Von Frey sphygmograph, Metronome with an electrical make and break attachment (the metronome was placed in a distant room and connected with the time marker through the switch board), Kymograph. The appearance of the stimulus was recorded by the hand on the drum. *Material.* (1) Comic pictures: Kemble's "The Turtle Sings a Comic Song" (1) and

“Frogville Country Club gives an open-air Hop” (II), Comic pictures (III-VII), Large Laughing Face (VIII), Fate of the Hungry Mule (IX), Christy's, The Youthful Prodigy (X); (2) Jokes: (3) The following reproductions of works of art: Gabriel Max', Katto Emerick (A), The Laocoön (B), Dürer's Crucifixion (C), Holbein's Madonna (D); (4) Landscapes: (a-d); (5) On given signal reagent was told to think of something funny (a¹), of something sad (b¹). *Method.* It seems undesirable, in view of the preliminary nature of this work, to give in detail the mode of procedure employed. It should perhaps be said, however, that a reading of the investigations of Mentz, Lehmann, Binet, Zoneff und Meumann, Brahn, etc., and a noting of the precautions to be taken, preceded the doing of the experiments. On beginning the experiments the reagent was asked to put himself as far as possible into a passive mental condition while awaiting the stimulus. He was also told the stimulus would be a picture or an anecdote but was not informed regarding its character.

Results. Table XVIII, below, shows:

1. That the breathing is more rapid after the stimulus has been given.

2. The following shows that the pulse has also increased in rapidity: (1) The average length of the pulse wave in the 6-12 waves immediately after the stimulus as compared with the corresponding length immediately before. (2) The average length of the beat in the entire curve before and after the stimulus. (3) The longest average pulse wave occurs but once in the first 6-12 waves after the stimulus. (4) The shortest average pulse wave usually occurs after the stimulus.

Zoneff and Meumann¹ found where the stimulus was the reading of something witty from the *Fliegende Blätter*, that with the understanding of the joke pleasure increased and the breathing became quicker and the pulse slower. The great differences in the reagent's judgments in connection with these experiments make it impossible to refer the great similarity as regards the physiological phenomena to any one kind of feeling. The close examination which the reagents were observed to give to the pictures makes one inclined to look upon voluntary attention as the psychical correlate of the phenomena just mentioned. At any rate, to do so is to be in harmony with many previous investigators.

It is evident from these results that *one may examine a good many comic pictures and yet get no peculiarly characteristic pulse and breathing curves.*

¹Zoneff u. Meumann, Ueber Begleiterscheinungen psychischer Vorgänge in Athem und Puls. *Phil. Stud.*, XVIII, 55.

TABLE XVIII.

Reagent.	Picture.	Judgment. ¹	Length of Respiration Waves in Seconds.		Average Length of Pulse Waves in Seconds.			
			Before Stimulus.	After Stimulus.	Before Stimulus.		After Stimulus.	
					Entire ² curve 20-40 waves.	First 6-12 waves.	Last 6-12 waves.	Entire curve 20-40 waves.
M. Y.	I	3+	3.8 3.8 3.8	2.4 2.7 2.7 3.0	.81	.81	.83	.75
H.	I	3	4.2 4.0 4.5 4.2	2.3 2.3 2.6 2.6	.70	.70	.69	.68
G. A.	I	2			.81	.83	.82	.77
C. M.	I	2+	3.5 3.5 3.6 3.5	2.5 3.3 3.3 3.9	.93	.91	.95	.96
H.	II	3+	4.5 4.1 5.6 4.1	2.2 2.0 2.8 2.7	.73	.71	.68	.68
C. M.	II	3+	3.0 3.1 3.9 4.0	3.5 2.8 2.9 2.2	.94	.90	1.0	.98
G. A.	III	I	4.1 6.3 4.6	5.6 2.9 5.2 5.7	.79	.79	.78	.84
G. G.	IV	I	4.1 4.0	3.7 5.5 3.4 2.9	1.21			1.16
G. G.	V	I	4.3 4.3 4.1	3.7 3.9 3.3 4.0	1.22			1.18
M. Y.	VI	3	3.0 3.0 2.7 2.9	2.1 2.6 2.7 3.0	.81	.78		.82
M. Y.	VII	I	3.2 3.2 3.0 3.0	2.6 2.5 2.5 2.5	.76	.75	.78	.78
M. Y.	VIII	2	3.0 2.8 3.0 2.6	2.2 2.8 3.0 2.8	.88	.84	.85	.86
M. Y.	IX	3+	3.5 4.0 3.4 3.4	2.8 2.6 2.7 2.9	.81	.81	.81	.79
J. W.	X		4.1 3.8 3.5 3.8	3.3 3.7 3.7 3.9	1.11			

Stimulus: A Comic Picture.

¹ For meaning of numbers see p. 66.² The entire curve before and after the stimulus equalled in each experiment the circumference of the drum. Sometimes the signal came near the centre of the entire revolution and sometimes not. This gives the difference in the lengths from which the average for the entire pulse curve was calculated.

TABLE XVIII.—Continued.

	Reagent.	Picture.	Judgment.	Length of Respiration Waves in Seconds.		Average Length of Pulse Waves in Seconds.					
				Before Stim- ulus.	After Stim- ulus.	Before Stimulus.			After Stimulus.		
						Entire curve 20-40 waves.	First 6-12 waves.	Last 6-12 waves.	First 6-12 waves.	Last 6-12 waves.	Entire curve 20-40 waves.
Stimulus: A Joke.	H.		2	4.1 4.1 3.5 4.1	2.6 2.9 2.6 2.7	.71	.68	.71	.67	.65	.66
	J. W.		2	4.9 3.7 4.0	2.8 2.7 2.2 2.5	.91	.91	.91	.90	.85	.86
	J. W.		1+	2.9 3.0 3.0 2.9	2.7 2.8 2.6 2.2	.87	.83	.88	.88	.80	.82
	J. W.		2	4.0 3.6 3.3 3.5	2.9 2.6 2.5 2.6	.87	.90	.85	.81	.77	.79
	J. W.		3	3.1 3.2 3.4 3.3	3.1 3.0 3.0 2.6	.94	.92	.95	.94	.87	.90
	J. W.		2+	4.1 3.9 3.7 4.1	2.7 5.0 3.1 3.4	1.10	1.08	1.12	1.06	.95	.98
Stimulus: Something funny is recalled.	T. N.	a ¹		3.0 3.3 3.3 3.0	2.9 2.2 2.8 2.3	.75	.77	.75	.69	.68	.71

TABLE XVIII.—Continued.

Stimulus: A reproduction of a work of art, in general tragic as regards what is represented.	Reagent.	Picture.	Judgment.	Length of Respiration Waves in Seconds.		Average Length of Pulse Waves in Seconds.					
				Before Stimulus.	After Stimulus.	Before Stimulus.			After Stimulus.		
						Entire curve 20-40 waves.	First 6-12 waves.	Last 6-12 waves.	First 6-12 waves.	Last 6-12 waves.	Entire curve 20-40 waves.
	H.	A		4.5 3.7 3.9 4.3	2.9 5.4 5.2 5.9	.72	.67	.72	.72	.70	.73
	C. M.	A		4.6 3.1 3.9 3.6	3.0 4.2 4.3 3.9	.93	.92	.92	.90	.91	.91
	J. W.	A		6.1 3.7 3.4 3.4	3.0 3.2 3.1 3.3	.73	.76	.77	.77	.78	.78
	M. Y.	A		2.9 3.6	3.5 3.5 3.1 3.2	.86	.81	.93	.85	.87	.86
	G. A.	A		6.9	4.7 5.1	.82	.77	.86			.84
	G. A.	B		6.7 6.2	5.6 5.5 4.7 4.4	.77	.74	.78	.72	.75	.76
	M. Y.	B		3.4 3.3 3.7 3.6	2.6 2.6 2.5 2.9	.77	.78	.77	.74	.81	.78
	H.	C		4.3 4.1 3.4 3.4	4.7 4.6 6.7 5.8	.71	.66	.71	.67	.66	.68
	G. G.	D		3.4 3.7 3.5	2.9 3.3 3.1 3.0	1.21			1.07	1.14	1.11
	M. Y.	E		3.3 3.2 3.3 3.3	2.9 2.9 2.9 2.9	.81					.72
Stimulus: Something sad is recalled	T. N.	b ¹		2.6 2.7 2.6 2.7	2.3 2.4 3.1 2.6	.68	.70	.66	.60	.65	.60

GENERAL SUMMARY OF EXPERIMENTAL RESULTS.

The experimental results show (1) that the comic impression from a picture decreases in the same experiment from moment to moment and in successive experiments from day to day, and that the rapidity with which this occurs depends partly at least upon the complexity of the details; (2) interspersing new pictures between the old, forced or spontaneous laughter, drinking coffee, good physical condition and high spirits, a non-rigid holding of the body and a longer period between the exposures of a given set of pictures, help the comic effect; (3) that "time differences" may exist when two pictures are successively examined and compared, that is, differences growing out of the fact that one picture is seen before the other; also "time influences," that is, differences arising from the unequal loss or gain of fun in the norm and the comparison at the same sitting and successive sittings; (4) that "space differences" which depend on whether a picture is at a reagent's right or left also exist when two pictures are compared; (5) that a sad or comic fore-picture affects the comic impression received from a given picture; (6) that the direction of the judgments of the degree of funniness and of the tendency to smile and laugh take a similar course; (7) that the presence of a smiling or doleful face in a picture increases its funniness; (8) that increasing the size of a picture and moving it help its funniness; (9) that the method of gradual variations is peculiarly adapted to investigating the particular degree of exaggeration which is most comic; (10) that looking at comic and other pictures and listening to jokes increased both the rapidity of the breathing and of the pulse.

C. DIRECTED INTROSPECTION.

Material and Reagents. Copies of Kemble's comic picture "Spring, Spring, Gentle Spring,"¹ which appeared in *Life*, April 23, 1903, and copies of the questionnaire were submitted to each of sixty students (thirty men and thirty women, referred to in the report by their initials) attending lectures at Stanford University on the Psychology of the Emotions. Throughout this investigation it has been observed, doubtless, that the reagents have largely been my students. I wish here to thank them all for the interest and careful thought they have invariably given to this work.

The questionnaire was also applied by two of the above re-

¹Through a mistake, the legend in the making of my block was reduced to "Spring, Gentle Spring." The picture is reproduced in Plate VI through the courtesy of the *Life* Publishing Company.

agents—Mrs. J. C. Byrd (J)¹ and Miss Marie S. Burnham (M), seniors in Stanford University and students in the English department,—to the sixteen comic pictures illustrating an article by Thomas E. Curtis entitled "Some American Humorous Artists," which was published in "*The Strand Magazine*, March, 1902. The sixteen comic pictures of the above article are referred to in the order in which they occur by the Roman numerals I to XVI.

All the data obtained by using the questionnaire as above indicated were tabulated and all final conclusions are based upon the results obtained from both sets of papers.

The Questionary. The following questionnaire bears directly upon the historical phase of the comic and was formulated with a view to testing the various theories that have arisen regarding the fundamental elements in the comic impression. It was for this reason that, as far as practicable, the original wording of the theories was preserved:

1. (a) Look at the picture and note carefully your ideas and feelings and state what first strikes you.

(b) If the picture is funny state what muscular movements (of the eye, head, arms, etc.), you observed in connection with your feeling of amusement and which occurred first. Also any change in breathing, heart beat, pulse, etc.

(c) Do you find yourself imitating any of the movements (or apparent movements) of the person or objects in the picture?

(d) In connection with the picture do you have any auditory, optic, gustatory (taste), olfactory (smell), tactile or other sensations?² If so, what is their relation to the funniness of the picture?

(e) Have you any associations in connection with this picture?

(f) Does the funniness grow out of these associations?

2. Make a judgment upon this picture making use of one of the following terms: 0, not funny or indifferent as regards funniness; 1, undecided whether funny or not (c, b, a); 2, slightly funny (c, b, a); 3, moderately funny (c, b, a); 4, very funny (c, b, a); 5, exceedingly funny (c, b, a).

3. (a) Do you feel like laughing at this picture?

(b) When tempted to laugh do you find yourself restraining or encouraging yourself to do it? Why?

¹I wish here to thank Mrs. Byrd not only for the laborious care with which she and Miss Burnham applied the questionnaire to the sixteen pictures but also for helping me to tabulate and get into accessible form the results obtained.

²I use the word sensation here for what is, strictly speaking, perhaps, a memory image. This was only done in order to obtain data which had a decided character of reality. Whether any consideration except the practical one mentioned would lead to the use of the word in such connections is a matter for future investigations in aesthetics to determine, it seems to me. (See Lipps: *Ästhetische Einfühlung. Zeit. f. Psy. u. Phys. d. Sinnesorg.* 22, 1900. Witasek: *Zur psychologischen Analyse der Ästhetischen Einfühlung, Zeit. f. Phys. etc.*, 25, 1901. Alexander: *Some Observations on Visual Imagery, Psy. Rev.* XI, 1904, 324.)

(c) Does everything that is comic in this picture make you laugh or feel like laughing?

(d) Is everything in it that makes you laugh or feel like laughing comic?

(e) Suppress entirely your tendency to laugh at the picture and give a judgment on it in terms given in question 2.

(f) Increase your tendency and do the same.

(g) If your laugh or tendency to laugh at the picture differs from that caused by cold, pain, tickling, animal spirits, kind feeling, self satisfaction, sardonic smile, etc. state if possible in what way.

4. (a) Was there anything of suddenness, of unexpectedness, of surprise, or of a release from a state of constraint, in the ideas or feelings which determined the funniness of this picture?

(b) If so, is it connected with the point of the joke in any way?

(c) Does it seem to you that the degree of funniness or the amount of laughter is determined by the suddenness, newness, unexpectedness or surprise?

(d) The term "stale" is often applied to a joke. Has it any significance here?

5. (a) Is the perception of the funny in this picture pleasurable? displeasurable? or indifferent?

(b) Is there anything funny in this picture which is not pleasurable?

(c) Is there anything in the nature of an alternation of feelings in looking at it? that is, an alternation from pleasure to pain?

(d) If so, does it constitute the funniness or help it?

6. (a) Do you find æsthetical (beautiful, ugly, natural, etc.), ethical (moral), or logical elements in the picture?

(b) If so, what are they, and what is their relation to the comic; that is, do they add to or take from it, or partially or wholly constitute it?

7. (a) Is there a feeling of superiority on your part in connection with the picture?

(b) Or has anything been degraded or belittled in the picture?

(c) Would you dislike to be or have your friends be the person or persons around whom the comic of the picture centres? Why?

8. (a) Is there anything of oddity, of resemblance, of congruity, of incongruity (ascending or descending), of contradiction, or of contrast, connected with your impressions of the picture? If so, what is its nature?

(b) Does the degree of funniness seem to depend upon the strength of the resemblance, congruity, incongruity, contradiction, or contrast?

(c) Do you observe anything in the way of rotation of ideas or feelings during your examination of the picture?

(d) Anything resembling tickling on the physical side?

9. (a) Does the picture appeal to your own past experience and is the laugh partly at yourself?

(b) Would you apply the term sympathetic to any of the impressions you have from the picture? Explain.

10. (a) Is there any particular thing in the picture itself which determines its funniness?

(b) Can you suggest a slight change in the drawing which would increase or decrease its funniness?

11. Do you observe three stages in the comic process? as—

(1) Does the preposterousness or pervertedness disconcert you?

(2) Does the suspense or strain increase until pressure becomes very great?

(3) Is the illumination then complete and does the pleasure then begin?

12. (a) What is it that determines your judgment that this picture is funny, that is, is it the ideas, the impulse to laugh, the feeling of surprise or expectation, the feeling of pleasure, or what?

(b) In stating how funny this picture is are you conscious of comparing it with any other remembered or imagined picture?

(c) If so, in what respects?

(d) If not, what determines how funny it is?

13. (a) What is the point of the joke in this picture?

(b) Formulate a theory of the comic based upon your examination of this picture, that is, give the constellation of feelings and ideas entering into that which gives you the impression of funniness.

14. Which of the following terms do you find most applicable to this picture—funny, laughable, witty, humorous, satirical, burlesque, droll, parody, ludicrous, ridiculous, ironical, comical, nonsensical, silly, caricature, cartoon? (*Lilly, Fortnightly Rev.*, LIX, 724.)

15. (a) At the end of answering these questions make a judgment on the picture using the terms given in question 2.

(b) Do you feel as much like laughing and are the physiological phenomena as strong as in looking at the picture first?

(c) Are you using the word funny with the same significance in giving your judgment now?

16. (a) Which of the following theories of the comic partially or wholly explain the funniness of the picture you are examining? In each case point out fully in what respects.

Aristotle (Poetics, ch. V). "Comedy is an imitation of the more worthless characters, yet not, however, in respect to every badness; but the laughable is a part of the ugly, for the laughable is in the nature of a missing of the target, and ugliness which is without pain and not destructive."

Quintilian. (Institutions of Oratory, I, Bk. VI.) "A saying that causes laughter is generally based on false reasoning, has always something low in it, and is never honorable to the subject of it."

Hobbes (Leviathan, Part I, 6; Human Nature, IX, 13): "Laughter is nothing else but sudden glory arising from some sudden conception of some eminency in ourselves by comparison with the infirmities of others or with our own formerly." "The passion of laughter proceedeth from a sudden conception of some ability in himself that laugheth. Men laugh at the infirmities of others, by comparison wherewith their own abilities are set off and illustrated." . . . "The same thing is no more ridiculous when it groweth stale or usual; whatsoever it be that moveth laughter, it must be new and unexpected."

Groos (*Einleitung in die Ästhetik*, 376): "In the comic there is an object given us which we hold for something perverted (*Verkehrtes*) and therefore consider with a feeling of superiority. Negatively it is accordingly desirable that in looking at such an object neither fear, nor sympathy arise because then the enlivening effect must necessarily remain absent." (For criticism see Lipps, Ch. II.)

Bain (The Emotions and the Will, 260): "The occasion of the ludicrous is the degradation of some person or interest possessing dignity, in circumstances that excite no other strong emotion. The element of the genuine comic is furnished by those dignities that, from some circumstance or other, do not command serious homage."

Kant (Kritik of Judgment, par. 54): "Laughter is an affection arising from a sudden transformation of a strained expectation into nothing." . . . "A jest must contain something that is capable of deceiving for a moment. Hence when the illusion is dissipated the mind turns back to try it once again and thus through a rapidly alternating tension and relaxation it is jerked back and put into a state of oscillation."

Hoeffding (Outlines of Psychology, 296): "Everything ridiculous has this in common, that something weak suddenly appears in all its significance through contrast to a superior power. The ridiculous presupposes that for a moment we have let ourselves be duped, puzzled, deceived by an illusion, or excited by an expectation, and that the whole affair is all at once changed into a mere nothing." . . . "The effect of a contrast, on which the ridiculous depends, results from a sudden conjunction of two thoughts or two impressions, each of which excites a feeling, and the second of which razes what the first erects." . . . "In humor there is a substratum of sympathy."

Lipps (*Komik und Humor*, 44). "The comic arises, if, in place of something expected to be important and striking, and under the presupposition indeed of the thought sequence which was to be expected, something making less impression for us, for our feeling, for our perception, for our present understanding, arises." (For criticism see Sully, *Prolegomena to a Theory of Laughter*, *Phil. Rev.*, IX, 1900, 371-378.)

Spencer (The Physiology of Laughter, 463): "Laughter naturally results only when consciousness is unawares transferred from great things to small—only when there is what we may call a descending incongruity."

* *Marshall*¹ (*Æsthetic Principles*, 165): "In the ludicrous there are transitions from mental processes involving effort to others where the same energy will produce greater effect." . . . "We have a tendency under such circumstances to laugh, or at least to smile, under the pleasurable excitement,"

Ziegler (*Das Komische*, II): "Three moments or movements can be distinguished in the comic. 1. Purposelessness of the mechanical process. 2. Inversion of purpose through the purposeless process. 3. Purpose in the inversion." . . . "The comic is a purposeless occurrence which through inversion of purpose calls forth the idea of purpose."

Hecker (*Physiologie und Psychologie des Lachens und des Komischen*): "In connection with what is comic there are one or more ideas which on account of their agreement and disagreement with the logical, practical and ideal norms (standards) may give rise to equally strong feelings of pleasure and displeasure." . . . "In the comic a pleasant and unpleasant feeling is aroused." . . . "In the comic is an intermittent, rhythmically interrupted pleasurable excitation."

* *Locke* describes wit "as lying mostly in the assemblage of ideas and putting those together with quickness and variety wherein can be found any resemblance or congruity, whereby to make up pleasant and agreeable visions in the fancy."

Schopenhauer (The World as Will and Idea, Vol. II, viii): "The ludicrous is the unexpected subsumption of an object under a conception which in other respects is different from it, and accordingly the phenomena of laughter always signifies the sudden apprehension of an incongruity between such a conception and the real object thought under it, thus between the abstract and the concrete object of perception."

Kraepelin (*Zur Psychologie des Komischen*, *Phil. Stud.*, II, 361): "That unexpected, intellectual contrast acts in the direction of the comic, which awakens in us a struggle of æsthetic, ethical, or logical feelings in which pleasure predominates." (For criticism see Lipps, Ch. III.)

Wundt (*Grundzüge der physiologischen Psychologie*, 4te Aufl., II,

¹ Theories starred were not in the original questionnaire.

349): "The single ideas, which form a whole of the perceived or thought in the comic, stand in subordination to each other or with a kind of connection partly in apposition, partly in agreement, and thus there arises a rotation (*Wechsel*) of feelings in which, however, the positive side, pleasure, not only controls (*verherrscht*) but is experienced (*zur Geltung kommt*) also in a particularly strong manner, because it, like all feelings, is increased (*wird gehoben*) through immediate contrast."

* *Melinaud* (*Revue des Deux Mondes*, XXVII, 626): Summary of several theories: That which makes us laugh is that which violates traditional usage. (Penjon, *Revue Philosophique*, etc.).

Ribot (Psychology of the Emotions, 351-357) accepts both theory of superiority and of incongruity (L. Dumont, *Des Causes du Rire*) as meeting distinct cases, but thinks sympathy mitigates feeling of superiority in higher forms.

Sully (The Psychology of Laughter; The Human Mind, II, 148-153): "It is uncertain whether the sources of the ludicrous effect can be reduced to one." (Dugas, *Psychologie du Rire*, holds a similar view.)

Kemble's picture "Spring, Gentle Spring" (which will frequently be designated as the Kemble picture) proved very satisfactory. In every instance the students in answering question 2 judged it funny in degrees varying from 2 b (slightly funny) to 5 a (the highest point of exceedingly funny). One student was uncertain at first but later gave a judgment of 3 a (moderately funny in the highest degree). The following table, the first line of which gives the judgments and the second the per cent of the students giving that particular judgment, shows how the picture was rated.

TABLE XIX.

Judgments.	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	2b	2c	1a	1b	1c	?	o
Per cent.	10	5	10	33.3	13.3	10	5	6.6	1.6	1.6	1.6					1.6	

All the *Strand* pictures were judged more or less funny by J in answering question 2. M found three of the pictures not funny and in general her judgments were lower than those of J.

Initial Source of Fun. As a whole the reports on the Kemble picture give the impression that the judgment is based upon the complete comic conception; but an examination of the answers to question (1 a) reveals the fact that almost two-thirds (38) of the students noticed at once some funny detail before they caught the full sense of the joke. It is significant that in all the above cases save three, the judgment falls within the high marks 4 and 5 (very funny and exceedingly funny). On the other hand, only a few of those who mention no special detail as having attracted their immediate attention give high

judgments. The funny detail first seen doubtless often starts the laugh and thus creates conditions favorable to the full and hearty appreciation of the joke. One of many to note the comical attitudes first, writes: "The ridiculous positions of these animals [lambs and rooster] seems to arouse the sense of the comic in me." Of those who are attracted at once by the ludicrous expressions, the verdict is almost unanimous that this is what starts the laugh. The following is typical: "At my first glance at the comic picture it did not strike me as being funny, but after I had looked at it for about a half a second . . . I noticed the humorous grin on the faces of the animals and I laughed until I thought I really must be foolish." The fact—that the feeling of amusement frequently arises from a detail rather than from the conception as a whole, and that this initiatory feeling doubtless adds greatly to the comic effect received later from that which properly speaking constitutes the joke, is further sustained by the reports from the sixteen pictures. J., who invariably notes some special centre of fun at the beginning, consistently judges the respective pictures higher than M., who does this less than one-half the time.

Movements in Relation to the Comic Impression.

1. *Muscular Movements.* In every case save three the feeling of amusement caused by the picture was accompanied by muscular movements, varying in number and complexity from the slight smile that involves but the muscles of the face, to the hearty laugh that brings into play almost all the muscles of the body.

While there is great diversity in the individual reports as regards these movements, the combined results indicate a certain regularity. Roughly tabulated they fall into the following categories, in the order given and with the frequency suggested:¹

1. The smile, beginning with the muscles of the mouth and extending to those of the eyes. [Almost invariable.]
2. The throwing back of the head. [Frequent.]
3. A deep breath before the laugh. [Occasional.]
4. "The laugh, beginning in the throat and passing to the diaphragm," "the downward movement of the diaphragm," followed by the "rise of the internal organs," and the expulsion of the air from the lungs in short successive "gasps," "chuckles," or "explosive sounds." [Laugh, almost invariable; other phenomena occasional with individual students but practically constant with J on the sixteen pictures.]

¹The classification which follows is taken directly from Mrs. Byrd's report on these movements. It is interesting because it confirms Spencer's observations (See *Physiology of Laughter*) with which Mrs. Byrd was not acquainted at the time she handed the report to me.

5. The bodily movements accompanying the laugh, indicated by such expressions as—"swaying back and forth," "convulsed with laughter," "doubling up," etc. [Frequent.]

6. Increased respiration. [Very frequent.]

7. Increased blood flow. [Frequent.]

8. The throwing out of the legs and arms, the violent slapping down of the hands, and similar movements. [Occasional.]

A comparison of the judgments given, with the reports on the above phenomena in individual cases, reveals the fact that the funniness decreases with the number and complexity of the movements. The table below makes this clear at a glance.

TABLE XX.

Character of Muscular Movements.	Corresponding Judgments.	Time of Occurrences.
Laugh, accompanied by other marked muscular movements.	5a, b, c, 4a, b, c,	15 33
Movement of facial muscles involved in smile, and muscles involved in respiration.	3a 3b 3c ? (afterwards 3a)	3 2 1 1
Smile.	2a 2b	1 1
Little or no impulse to smile, and no muscular movements.	4a 3b	1 2

With a single exception, readily explainable by the nature of the associations aroused, the high judgments 4 and 5 are found in connection with the "laugh, accompanied by other marked muscular movements." The students themselves were sometimes aware of the fact that movement helped the comic effect. H. W. says, for example, that he has an almost irrepressible desire to yell "whoop la," and that it helps him appreciate the fun of the picture because "there is so much movement in it." The two others who record no physiological phenomena yet give a judgment 3 b (moderately funny), both admit that they purposely refrain from laughing—one because she considers it "a waste of time to laugh," the other because "it seems too silly." A comparison of the judgments given at the close of the experiment, with the presence of the laugh and accompanying physiological changes, adds fresh data to the results already

obtained. In every case but three, where a high judgment is given at the end, the students still experience the desire to laugh in varying degrees, and physiological phenomena more or less marked, according to the variations in the judgments. In the five cases where there is an increase in funniness recorded, there is a corresponding increase in the impulse to laugh and in attendant muscular movements. On the other hand, where the final judgment is low or the funniness has ceased entirely, there is a conspicuous absence of all such physiological changes.

The reports from the sixteen pictures furnish further proof that the presence of muscular movements enhances the appreciation of the comic. With both reagents, when the pictures were rated high, the experience was accompanied by the laugh and physiological phenomena. But with the nine judgments falling below 2 b (slightly funny) no movements are recorded except in one instance—J rates picture III, as 2 c and is conscious of a "slow smile."

The foregoing results lead to the conclusion, that *muscular movement is an important element in the experience which we call the comic, and that as regards number and complexity such movements run parallel with the strength of that experience.*

2. *Imitative Movements.* The results show that the Kemble picture was peculiarly fitted to bring out imitation as a factor in the comic. Of the sixty students all but nine report that they felt distinct imitative impulses. Thirty-seven felt a strong tendency to skip about and frolic with the animals; twenty-three smiled with the faces or took on their comical expressions; twelve experienced both of these impulses; and five tended to assume the attitude of some object in the picture. All this seems to point to imitation as a factor to be reckoned with in the study of the comic. A comparison of the individual reports with the judgments shows that the highest appreciation of the comic is always found in conjunction with the most pronounced imitative tendencies; and further, that the degree of funniness, in this picture, is largely influenced by the nature and complexity of the imitation. The results of this comparison appear in Table XXI. In I are given the judgments of those who have a tendency to gambol about with the animals and to smile with the smiling faces in the picture. In II the judgments of those who have a tendency to gambol about with the animals, accompanied by a corresponding joyous feeling but by no conscious tendency to imitate the smiling faces. In III the judgments of those who have a tendency to imitate the smile or comical expression on the faces but with no other imitative tendencies. In IV the judgments of those who have a tendency to assume the attitude or imitate the movement of

some one object in the picture. In V the judgments of those who have no tendency whatever to imitation. The figures in the columns under the judgments 5 a, 5 b, etc., indicate the number of times the particular judgments occurred.

TABLE XXI.

Character of imitative impulses.	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	2b	2c	1a	1b	1c	?	o	Total number of judgments.	Range of judgments.
I	3	4	3	1		1												12	5a-4c
II	2	1	2	12	5	2		1										25	5a-3b
III				6	4	1												11	4a-4c
IV				2			1		1		1							5	4a-2b
V				1	1	2	3		1							1		9	4b-?

In I, where there is a combination of imitative impulses, that is, the tendency to spring about and the tendency to smile, the range of judgments is limited to the high marks 4 and 5. Of the twelve listed, ten fall within the highest (5 a, b, c). In II, where there is a tendency to imitate the springing movement but not the smile, the range is wider, 5a-3b. But nineteen of the twenty-five fall within the second highest mark (4a, b, c). In III, where the smile alone is imitated, the entire eleven fall within 4, six of them reaching the highest degree, 4a. IV, where there is diversity in the imitation, naturally shows a wider range of judgments, 4a-2b. The two who give the high mark 4a felt themselves running with the man to escape from the bull. The funny associations aroused in both cases by the incident, probably account for the high judgments. On the other hand, the two who gave the low judgments experienced an imitation which involved a strongly counteracting sensation.

This brings us to a point which should be mentioned. Throughout this investigation it has been observed that wherever the imitative impulse is found in connection with a tendency to inhibit movement, the judgment is invariably low. The cases mentioned in IV are conspicuous examples. The one who gives the judgment 3c, feels a tendency to assume the attitude of the rooster, but she also experiences fear (says she can feel the "smooth, soft, slimy snake" and it makes her "shudder") which is paralyzing in its nature; another, whose judgment is 2b, says that he instinctively imitates the piper and immediately feels himself "grow drowsy." Another case

in point is the single low judgment (3b) among those who felt the impulse to spring about. This student says: "I felt a slight tendency to imitate the dancing lamb," but "when I looked at the birds I had a feeling of trying to soar and being weighted down by that burdensome spring." And M, who worked on the sixteen pictures, after looking at picture IV of the *Strand* set, writes, "I held my breath in suspense with the actor and experienced a sinking, discouraged feeling." These and other instances, seemed to indicate *that any sensation which arises from an inhibition to motion tends to decrease the funniness of the experience.*

Of all the imitative movements, the smile has the most immediate and the most lasting effect on the final comic impression, as expressed in the judgment. As has been indicated elsewhere *the imitative smile doubtless often starts the laugh before the real point of the joke is apprehended*, thereby creating conditions conducive to a fuller appreciation of the humor of the whole situation. P. C.'s experience may serve as a type. She says: "The fact that all the animals in the picture seem to be laughing makes me want to laugh at once." Further, this imitative smile not only starts the laugh, invariably followed by the high judgment, but occasionally it seems to be *the only source of fun in the picture*. P. W., who sees "absolutely nothing funny in the whole thing but the comical expression on the faces," rates his experience as 3b. Two others, who declare themselves at once as "disgusted at such nonsense," catch the broad smile of the moon and seem forced to give the high marks 4c, 4a. The reports from the sixteen pictures furnished two interesting parallels. J in connection with picture III, and M in V, are prompted by strong ethical feelings to denounce the situation depicted—age ridiculed by youth—but are forced over and over, in spite of themselves, to laugh with the boys until they give higher judgments at the end than they did at the beginning. Not only does this imitation of the smile make the whole experience funnier, but it serves to keep it so. Scattered throughout the reports are references showing that *the fun is continually being revived by the sympathetic smile*. For example, P. G. gives her judgment of the picture in the beginning as 5c. Throughout her report she refers directly or indirectly to this imitative tendency and at the close she rates the picture as 5c, her original judgment. When we remember that this questionnaire required long and close analysis, we cannot be surprised that with the majority of the students the funniness decreases greatly or vanishes entirely toward the end of the experiment. Notwithstanding this, the twenty-three who feel the tendency to imitate the smile give comparatively high judgments at the end. Only one falls

below "moderately funny," and the student giving this was familiar with the picture before the work was begun. It is significant to note that nine of these twenty-three judgments are as high as the initial ones, two are higher, and the remaining eleven show a slight decrease, in no instance to be compared to the falling off indicated in the reports of those who experience no tendency to smile. From these reports and the results of the experiments of Series 4, (1) we are better able to understand why the comic mask was worn in Greek comedy, why the comedians on our stage often precede their jokes by a smile or laugh, and why certain funny stories related in the very same words sometimes seem in one case much funnier than in the other.

Finally, since it may be argued against the conclusions here drawn on imitation as a potent factor in the comic impression, that this picture is especially adapted to imitation of movements peculiarly conducive to a joyous state, and that the conclusions reached in this experiment will not hold good in other cases, it is very important to note at this point that the results from the varied material of the *Strand* pictures are even more convincing than those from the Kemble picture. With both reagents, wherever the judgment rises above the "slightly funny" mark, there is imitation, varying in nature and complexity according to the degree of funniness. Below this mark there is none recorded. J, who imitates every smile or takes on the comic expression depicted, consistently rates the individual pictures much higher than M, who feels this tendency but five times. Further, these five instances represent M's highest judgment, and in each case the pictures grow funnier toward the end. J's records also sustain the point, that the constant recurrence of the imitative smile renews the humor of the whole situation.

From this investigation, then, it seems safe to conclude:—*that imitation enters as a factor in the comic impression; and that the number, intensity, and character of the imitative tendencies determine, to an appreciable extent, the degree and persistency of the comic experience.*

The part taken by imitation in the comic impression was, however, still further investigated. Twenty-seven reagents, seven of whom had taken part in answering the questionnaire, who found the Kemble picture funny, were asked to imitate the movements represented in the picture and to state whether it increased or decreased its funniness. Twenty reported an increase, two a decrease and five no change in funniness. Again, the picture (Plate VII) which had been drawn in two sizes and the larger of which had been more frequently judged funnier (See p. 70), was shown to many persons and they were

asked in case they observed imitative movements to state in connection with which one these movements were more frequently present or stronger. The almost invariable answer was in connection with the larger, that is, the one which had been most frequently judged funnier. The conscious imitation of the movements represented in this picture also increased the funniness. Finally, a mass experiment was made in which the pictures in Kemble's "Pickaninnies" were used as material and ten reagents, six of whom had worked at least a year in the laboratory, took part.

Each reagent was shown the pictures in turn, the legends having been previously covered, and asked to give his judgment of its degree of funniness by using the terms, not funny (o), slightly funny (1), moderately funny (2), very funny (3). The reagent was also asked to observe whether there were imitative movements in the (a) mouth, (b) eyes, and (c) other parts of the body, and to use the terms no movements, slight movements, moderate movements and strong movements in giving his judgments.

TABLE XXII.

No. of movements	C	Co	Ar	Ne	N	CS	K	W	H	Ma	Total
Mouth	16	14	24	31	22	16	20	28	27	32	230
Eyes	4	20	12	18	16	23	21	21	24	27	186
Body	9	5	10	2	13	18	20	20	27	21	145
Total	29	39	46	51	51	57	61	69	78	80	561
Sum of judgments	29	31	38	66	58	65	44	74	68	63	

The above table shows the whole number of times that movements of the mouth, eyes, and the remaining parts of the body occur in case of each reagent and the totals of such movements for each and all the reagents.

The numbers in connection with the total judgments were obtained by assigning the values 3, 2, 1, and 0 to the judgments very funny, moderately funny, slightly funny and not funny, respectively, and then taking the sum of the numbers obtained with each reagent. A careful comparison of the above results with all the judgments obtained in each case seems to justify this very crude method of determining the order in which the reagents stand as regards the degree of funniness of the pictures as a whole.

The reagents arranged in the same order as in the table,

that is, beginning with the one who reports the smallest number of movements and ending with the one who reports the greatest number, stand:

C, Co, Ar, Ne, N, CS., K, W, H, Ma.

The above reagents arranged in order in accordance with the sum of the numbers corresponding to their judgments regarding the funniness of the pictures and beginning with the one who has the lowest judgment, stand as follows:

C, Co, Ar, K, N, Ma, CS., Ne, H, W.

In spite of the extreme crudeness of the method, the agreement between the judgments regarding the greater funniness and the greater number of movements reported is certainly striking, especially in view of the fact, that the four reagents who agree best have done work in the psychological laboratory for a year and that two of them (C and Co) are doing advanced work. These results also show, by a method more reliable probably than the questionnaire, that more imitative movements are present in the case of the reagents who give the higher judgments and *vice versa*. Attention should be drawn to the fact that this conclusion is based upon the total number of movements and not upon those of the mouth alone. In fact, the mouth shows the widest divergence.

It will be seen from the table that the mouth is more prone to imitative movements than other parts of the body. The reports of these reagents show, as has been observed elsewhere, that imitative movements of the mouth, even if not connected with smiling, often occur in connection with a high judgment regarding the funniness; as, for example, in case of picture 39, "Aint no mo' fun," etc.

Table XXIII, below, shows the range of the imitative movements in case of each judgment; that is, under I, the per cent of the whole number of judgments of that class in which there were no movements at all; under II the per cent where there was movement in one part (the mouth, eyes or other parts of the body); under III in two parts; and under IV in three parts. In Table XXIV, I gives the ratio of the number of cases of no imitative movements to the number of judgments of each of the judgment categories; II the same ratio where there are slight imitative movements; III where there are moderate imitative movements; IV where there are strong imitative movements.

The results of these tables show that a wider range of imitative movements is present in case of the higher judgments; that imitative movements of greater strength are present in case of higher judgments; that the comic impression is not always accompanied by imitative movements and conversely.

Sensations other than those connected with movement. The question regarding the sensations experienced has been very

TABLE XXIII.

Judgment categories.	I	II	III.	IV
Judgment 0 (.12)	.45	.35	.18	.02
Judgment 1 (.31)	.13	.42	.34	.11
Judgment 2 (.37)	.08	.23	.44	.25
Judgment 3 (.20)	.00	.10	.38	.52

TABLE XXIV.

Judgment categories	I	II	III	IV
Judgment 0	2.25	.45	.25	.07
Judgment 1	1.57	.96	.39	.16
Judgment 2	1.13	1.05	.64	.15
Judgment 3	.57	.73	.98	.71

incompletely answered in case of the Kemble picture. Of those reporting below "very funny" only one reagent reports on her sensations, and she experienced disagreeable sensations in connection with the snake. Of the fifty reagents giving a judgment above "moderately funny" but forty report. Thirty-one of these experience what they call sensations. They are in many instances evidently very weak, and as a whole auditory in nature. Only eight gave an opinion of the effect of sensations on the comic impression. Five of these thought they helped it and the remainder that they had no effect. At the close of the study the above reagents experiencing sensations reported them as less strong or entirely wanting. In case of the sixteen pictures, J, whose judgments, as has been stated, are much higher as a whole than those of M, has auditory, etc., sensations in connection with thirteen of the sixteen pictures, while M experiences such sensations but twice. In general, J reports these sensations as adding to the funniness but occasionally she finds that they detract from it. In her judgment (3a) on picture VII she says, for example, "the Irish brogue adds to the funniness" but on the picture IX (judgment 2c) "the baby's cry (she is herself a mother) materially detracts from it." The only other picture upon which J gives a judgment below "very funny" where there were auditory, etc., sensations present, is that upon which M also gave a low judgment

under similar conditions. J does not "see" as does M the breathing of the old man but "hears" it and "feels hot and uncomfortable with him."

In view of the previous report it seemed desirable to obtain further data along this line. The Kemble picture was placed before twenty-seven different persons (who found the picture funny),—seven of whom had taken part in answering the previous questionnaire,—with the following questions:

1. (a) Do you have any auditory, optic, gustatory (taste), olfactory (smell), cutaneous (skin), organic (muscular, circulatory, respiratory, etc.) or other sensations in connection with the picture? If so, state what they are. (b) Seek to arouse such sensations as would be in accordance with what is represented in the picture. If you succeed state whether they increase or decrease the funniness of the picture.

2. Look at the picture until it ceases to be funny. (a) Do you have the same sensations and imitative movements as at first and are they as strong? (b) If not, try to arouse the sensations and imitate the movements and state whether the funniness is revived, partially or wholly, by so doing.

The answers to the above questions are recorded in per cents in the table below. The sum of the per cents under each head subtracted from one hundred shows the per cent of those persons making no report.

TABLE XXV.

1		2	
a	b	a	b
Affirmative, .93	Increase, .59	Affirmative, .04	Funniness partially revived, .51
Negative, .07	Decrease, .07	Negative, .66	
	No effect, .07		
	Unable to arouse sen- sations, .15		

To conclude this point,—the following considerations would lead one to suppose *that sensations enhance the comic effect*: (1) the frequent presence of sensations when the picture is judged above "moderately funny," and their absence when the judgments fall below this mark; (2) the introspections of the re-agents reporting very marked sensations; (3) the fact that sensations are less strong or unnoticed when the picture has ceased to be funny but that the arousing of the sensations previously observed often revives the comic effect; (4) the fact

that the arousing of appropriate sensations when they were not at first present increases the comic effect. The introspections of the reagents throw some light as to why sensations enhance the funniness. To use the words of one of them, "They put one into the spirit of the picture;" of another, "The picture seems dead" without them. It is probable, too, as another reagent points out, that they increase the element of contrast. The few cases where the effort to arouse sensations not only did not arouse or increase the comic impression but decreased it is doubtless due to what has been noted before—that the comic impression is accompanied by physical manifestations which are opposed to everything in the nature of a strain. In connection with this point, and as an introduction to the next, it should be said that the increase in funniness attributed to the arousing of sensations and the making of imitative movements appropriate to the picture *should be referred at least in some cases to the associations aroused*. This is well brought out by the introspections of two reagents. After imitating the movements and reporting an increase in funniness, they added, after a momentary pause, that they believed they were laughing at themselves.

The Part Played by Association in the Comic Impression.

An examination of the data collected from the papers shows association to be an important element in the comic. With forty-eight of the sixty students, associations are aroused by the Kemble picture which influence the *judgment according to the nature of the mental state which they induce*. Table XXVI, below, is an attempt to show the effect of the different kinds of associations upon the judgment. In line A are given the judgment categories. In B and C respectively the number of judgments of that particular class at the beginning and at the end of the examination of the picture. In I are given the results where associations amusing in their nature are present; in II, where the associations are not particularly amusing but very pleasant; in III, where the associations are indifferent as regards feeling of amusement, or are actually unpleasant; in IV, where there are no associations.

In Section I of the table, 42 judgments are listed which were accompanied by associations decidedly amusing in their character. The judgments here are consistently high, twelve in 5 (a, b, c); twenty-six in 4 (a, b, c); two in 3a, one in 2b and one "undecided whether the picture is funny or not." The associations recorded were peculiarly adapted to bring about a jovial frame of mind. Nursery rhymes lead, with "Tom, Tom, the Piper's Son" and "Hi-diddle-diddle" as prime favorites. Personal reminiscences come next, and of these, the recollection

of having been chased by a bull is the most frequent and the most fun inspiring. "Spring poetry," "spring chicken," "spring lamb" with their broad power of comic suggestion, give place to the quieter amusement of the "Pied Piper of Hamelin" and the quaint pastorals of Edmund Spenser. From the prepon-

TABLE XXVI.

I	A	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	2b	2c	1a	1b	1c	?	0
	B	5	3	4	14	7	5	2				1					1	
	C	6	2	1	8	1	2	5	4	4	3	1	2					2 ¹
II	B	1		1	1													
	C			1				1					1					
III	B							1		1	1							2
	C															1		
IV	B	1			5	1	1		4									
	C										2	1	1	1				7

¹One reagent gave no judgment after examining the picture.

derance of high judgments found here as compared with Section IV, where no associations are recorded, we may infer that the fun aroused by these revived experiences is carried over to the actually present experience and incorporated with it. A study of the individual cases brings out more clearly the direct bearing that associations have on the comic. *First, things not*

funny in themselves become funny through association. In answer to question 3c of the questionnaire (p. 84), "Does everything that is comic in this picture make you laugh or feel like laughing?" G. K., replies: "All the comic objects do not make me laugh, except by association." And to 3d, "Is everything in the picture that makes you laugh or feel like laughing comic?" A. B. answers: "Some of the things I laugh at may not be comic, but they awaken remembrances that are funny and I laugh." Again, C. B., who is undecided at first whether the picture is funny, later recalls her "Mother Goose" and many amusing personal incidents and at the close of the report gives the judgment 3a. *Secondly, humorous associations frequently occurring, keep off staleness from the comic impression.* Table XXVI makes this apparent at a glance. A comparison of the initial and final judgments set forth in Section I, where "associations of an amusing nature" are recorded, shows a remarkable holding up of the high judgments at the end. An examination of the individual cases shows that six give a higher, and ten as high a judgment, at the end as at the beginning. On the other hand, in Section IV, where there is an absence of any such associations, there is a decided drop in the judgments, the majority registering 0. *Thirdly, associations increase the fun of an already humorous situation.* Six students of Section I give higher judgments at the end than at the beginning. Each of these has associations, personal and literary, of a highly amusing character; and it is significant to note that many of these do not arise until late in the examination of the picture. A similar increase in the final judgment where the associations have been indubitably funny throughout the examination of the pictures is likewise noticed in the *Strand* set. In eight of the sixteen pictures, M's judgment is higher at the end than at the beginning, and in case of J the same is true for four of them. Moreover, the introspections of these reagents show that they are conscious of a tendency to invest the actually present situation with the funniness aroused by the recalled one, and to fuse both into a single experience. *Fourthly, amusing associations are able in part to overcome other influences acting in opposition to the comic impression.* The one element of the Kemble picture which seemed to elicit any sympathy bordering on the painful was the "man chased by the bull;" but in every case where the students recalled personal reminiscences in this connection, the sympathy vanished entirely. The sixteen pictures with their more varied material furnish many examples of this kind. J's and M's experience with picture VII is typical: their feeling of sympathy for the babies and disgust at the squalor of the surroundings is counteracted by the feeling of amusement which arises in connection with an

Irish family with which each of them associates it. A word only in regard to the relation to the comic of associations which are pleasant, or actually unpleasant, but not amusing in character,—Section II of Table XXVI shows that in a few cases high judgments are found in conjunction with associations that are not particularly amusing, but very pleasant. This fact is supported by the reports from the *Strand* group, where, in connection with six pictures, exceedingly agreeable associations are reported, which seem to create a mood conducive to high comic appreciation. Section III of this same table indicates that where the association is actually unpleasant, comic appreciation is low, and M, in reporting on the *Strand* set, gives a low judgment where one of the pictures reminds her "how tired, panting and breathless" she is at the end of a run.

Concerning the Part Played by Laughter in the Comic.

All the reagents reported themselves as feeling like laughing at the pictures used in this investigation whenever they were found funny.

Twenty-three of those reporting upon the Kemble picture say they encouraged this feeling. Among the reasons assigned for so doing are "it is meant to be funny," "to bring out the fun," "it seems funnier," "to see new things," to "appreciate the picture better," "I answer questions better when laughing," "mirth is healthy," "feeling is pleasant," "everything in the picture is laughing." Twenty-four reagents report themselves as restraining their tendency to laugh. Among the reasons are "because in classroom," "do not dare begin," "no one to enjoy it with me," "foolish to laugh alone," "waste of time," "force of training," "force of habit," "it seems silly," etc. The remaining twelve reagents find themselves neither restraining nor encouraging themselves to laugh. In case of the *Strand* group, J neither encourages nor discourages her tendency to laugh. M waives the question or does neither, except in two cases.

The importance of ascertaining whether the students were encouraging or restraining themselves as regards laughter, is immediately seen if one examines the table below in which the judgments of those encouraging themselves in laughing are put in Group I; of those discouraging themselves in Group II, and of those neither encouraging nor discouraging themselves in Group III. In this table 5a, 5b, etc., have the same meaning as in the other tables of the questionnaire, and the numbers under them indicate how many times the particular kind of judgment occurred.

The most casual examination of the table shows conclusively that even *the involuntary restraining of the laugh tends to decrease the funniness of a comic picture.*

TABLE XXVII.

	5a	5b	5c	4a	4b	4c	3a	3b	3c	2a	No. of judgments.
I	4	2	2	6	7	1	1 ¹				23
II	2 ²	1	2	6	3	2	2	4	1	1	24
III	1	1	1	2	4	3					12

Below is given a classification of the answers to questions 3c and 3d of the questionnaire:

KEMBLE PICTURE.		Number of affirmative answers.	3c	42
			3d	48
		Number of negative answers. ³	3c	18
			3d	12
STRAND PICTURES.	J	Number of affirmative answers.	3c	16
			3d	16
	M	Number of negative answers.		
		Number of affirmative answers.	3c	9
			3d	10
		Number of negative answers. ³	3c	2
			3d	

¹This reagent says she "tried to laugh but could not."

²One of these reagents says, "I have to restrain myself or I would be laughing all the time," and her judgment does not vary during the writing of the paper from 5a (the highest form of exceedingly funny). The other is one of those exceptional reagents whom restraint makes "want to laugh more" and through this a picture is made funnier.

³The negative answers to the above questions, in which "the man chased by the bull," "the parody on Pan," "the placard on the old man's back," etc., are mentioned, can be easily reconciled with the positive.

Entirely suppressing the laugh or the tendency to laugh, decreases the fun of the Kemble picture for fifty-three of the students and for one increases it. On the other hand, increasing it, makes forty-eight of the reagents find the picture funnier and five less funny. In case of the sixteen pictures where the laugh was suppressed, fun was decreased in every case for J; for M there was decrease of fun in case of five of the pictures and increase in one, J finds that encouraging a laugh increases the fun in nine cases and has no effect in the remaining. M's remark that "the forcing of a laugh" makes her "sick to her stomach" explains why, except in one case, the encouraging of the laugh has no effect or decreases the fun of a picture. J states in this connection that she always induces or suppresses her laugh by *thinking* of something funny or sad. This suggests that the effect of the induced or suppressed laughter on the funniness of the pictures may be explained, at least sometimes, by the new associations thus introduced.

In view of these results and those obtained in connection with other methods, *one can have no doubt that laughter and the feeling of funniness go hand in hand.*

The answers to the question regarding the manner in which the laugh in connection with a comic picture, differs from "that caused by cold, etc.," threw some light on the nature of the comic impression as the following will show: "similar to a sardonic smile," "somewhat like that of tickling," "less physical than that connected with cold," "like that of self satisfaction," etc.

Novelty as an Essential Element in the Comic. The terms "suddenness," "newness," "unexpectedness," and "surprise," selected from representative theories of the comic, were purposely combined in question (4a) to allow for individual interpretation and to deduce, if possible, the element common to all. The results clearly show that although in individual comic experience nice distinctions may be drawn, *novelty in one form or other is always present.*

All the reagents who saw the Kemble picture for the first time say "that the degree of funniness or the amount of laughter is largely determined by the suddenness, newness, unexpectedness or surprise, involved in the experience. Furthermore, a comparison of the judgments given at the beginning and at the end of the examination of this picture, substantiates their statements. Forty-three of the sixty final judgments are lower than those at the beginning; eleven equal; and six greater. Twenty-five of the forty-three that decrease, fall below the "slightly funny" mark (2), and eleven show that humor has entirely disappeared from the experience (0). The above eleven cases in which the fun persists to the end, and

six in which it increases, show why newness has not been made an essential element in some theories of the comic. These cases have perhaps been sufficiently accounted for in connection with the discussions of the arising of amusing associations and the imitation of the smiling faces which continues throughout the examination of the pictures. There is, however, in the recognition of new and humorous details at intervals an additional reason for the renewal of the fun. One reagent says, for example, "Every time I saw a new object with springs it caused a new laugh." Many similar extracts might be made to show that the involuntary transferring of the attention from one detail to another not only prolongs the fun of the situation but gives, at least partly, to the comic impression that wave-like character so commonly observed.

The objection may be raised that what has been found true with regard to novelty in the case of the Kemble picture may not hold good in other cases; but the results from the sixteen pictures also confirm the idea of Hobbes and others that "the same thing is no more ridiculous when it groweth stale and usual."

As regards the answer to the question concerning the connection of newness, etc., with the point of the joke, the reports agree that it creates a mental condition variously termed "puzzled constraint," "tension," "suspense," "wonder," "surprise," and "expectation"—which is favorable to "the perception" and "appreciation of the joke."

Pleasure as an Essential Element in the Comic. Without a single exception the reagents who studied the Kemble picture testify that the perception of the funny in the picture is pleasurable. The same is true of J's report on the sixteen pictures and of M's also, except in two cases where she reports minor details that are painful and yet funny. Nine others of the above reagents also mention some detail (the snake, etc.), which is comic but decidedly unpleasant to them personally. The others who find unpleasant details think they become funny and pleasurable by being placed in connection with something else. In view of these results one readily sees why in several theories of the comic (Plato, Hecker, Lehmann, etc.), displeasure as well as pleasure have been thought to be present.

As regards alternation of feeling in connection with the comic impression, J, in reporting on the sixteen pictures, and twenty-seven of the sixty reporting on the Kemble picture, mention some regularly recurring change of feeling, varying in intensity from decided pleasure to indifference or actually felt sympathy and pity. Three of these who consider that the alternation of feeling has no effect on the funniness give a low judgment (? , 3b and 3a) and speak only of a rotation of feeling

from indifference to pleasure and back again to indifference. The others who express an opinion give a high judgment (4 and 5) and say they experience a sharp conflict between sympathy with the distress of some creature, and the feeling of amusement provoked by its ludicrous situation in the picture. These reagents seem to think that this "oscillation" adds to "the final comic effect through contrast." On the other hand, while part of the opinions confirm Wundt's and allied theories, some are more in harmony with that of Groos. M, for example, in examining pictures IV and V, and both reagents in examining III and VII, feel that the strong sympathy aroused for the victim of the joke acts in direct opposition to the comic.

In view of all the reports it seems safe to conclude that *the complex experience out of which the final feeling of fun arises may contain elements of pain,—sympathy, pity, disgust, resentment, etc.,—which, if properly subordinated, may give rise to an alternation of feeling on the whole pleasurable, which adds to the final comic effect.*

The Relation of Æsthetic, Logical, and Ethical Elements to the Comic. The reports as a whole show that the average individual is conscious of the "logical, practical and ideal norms" of Hecker and of "the struggle of æsthetic, ethical and logical feelings" of Kraepelin. All the reagents find æsthetic elements, in so far as the natural and ugly may be considered æsthetic, and logical elements present in the pictures; though very few speak of elements of beauty properly speaking, or of ethical elements. Artistic execution is thought to add to the comic effect, but the beauty of what is presented is not in itself thought to do so. From my own introspections in connection with these and other pictures I am inclined to agree with the reagents who reported on this point that the introduction of beauty of a traditional and narrower type, interferes with the comic impression. Every one observes, in examining beautiful pictures of the kind mentioned, that a state of repose is more favorable to such æsthetic contemplation, and that everything in the nature of a jar, which favors the enjoyment of the comic, interferes with it. In view of this fact, it would seem, that except as this narrower and traditional kind of beauty is introduced in the way of contrast or to enhance the probability of the situation, it is foreign to the comic. The above statement will scarcely be questioned if by beauty we mean mere prettiness. My own impressions, for example, from Stanlaw's and Christi's pictures, as well as the answers of persons whom I have questioned in regard to the point, show this.

On the other hand there is in our time, especially in connection with landscape painting of the impressionist school, a kind of æsthetic contemplation peculiarly physical, in which all the

senses seem to be involved, and which is not only not foreign but allied to the comic enjoyment of the more refined and delicate kind. One of the reagents expresses this well in saying "I find æsthetic elements in this picture in the joyous exuberance of animal life. These æsthetic elements constitute in part the comic element of the picture." It is this kind of æsthetic pleasure which one receives from two of the prize comic pictures published in the *Century* of September, 1902.

In its broader meaning, where the æsthetic includes the ugly for the purpose of gaining in virility and character, the comic and the æsthetic have much in common. It is for this reason that journals like *Jugend* where the comic and the æsthetic stand side by side (see for example, *Ein Liebeslied* and *Der Schusterjunge*) find such an appreciative audience among critical people. The non-agreement of the reagents regarding whether naturalness adds to the comic effect may be due partly to their non-agreement regarding whether a particular thing is natural. This idea occurred to me in connection with pictures representing automobiles frightening horses, the heads of which are so often made very large in proportion to their bodies. It was only after I had been backed down an embankment by two such frightened steeds that I realized that such caricatures really represent what those seated in the carriage see.

As regards the form of unnaturalness which is denominated caricature and which is found in the Kemble picture, the reagents agree that it adds to the funniness. This is partly due, doubtless, to the introduction of the element of newness which has been shown in so many experiments to enhance the comic effect.

All agree that both the logical and the illogical elements help the comic, but no agreement is found on the part of those who mention ethical elements. J, for example, finds ethical considerations arising in connection with her experiences with the *Strand* pictures nine times. Six add, two take away, and one has no effect whatever. M does not report specifically in regard to this matter, but what she says shows a strong tendency to dwell upon the moral aspect of the situations presented, and her generally low judgments regarding the funniness of the pictures seem to indicate that these moral reflections materially decrease the comic impression. On this point it may be said that probably where the fun is of such a character as to arouse pain, from the ethical standpoint, it may, if not too strong, strengthen the comic effect. Where, for example, as in a cartoon, the comic and the ethical have the pleasure in common that comes from the caricaturing of some weakness, it would seem from the results that the ethical may heighten the comic effect if the kind of pleasure derived from it is not too absorbing. In

this connection a recent remark of Mr. Steele the Cartoonist of the *Denver Post*, is interesting. He says "cartoons are not funny."

One ought not to leave this point without drawing attention to a phase of personification, if one may so call it, which is important in this connection. Each reagent tends to enter into or to assume the character of some one of the individuals, or even things, represented. In the Kemble picture one becomes the "piper," another the "farmer" and another some one of the animals. In picture III (Plate III, Slide 6) of the sixteen pictures, M becomes the old man, J one of the boys on the fence. This fact often largely determines doubtless the extent to which the ethical element enters into the comic as a determining factor.

The Part of Superiority and Degradation in the Comic Impression. Thirty-seven of the reagents have a feeling of superiority in connection with the Kemble picture. The remaining twenty-three report themselves as having no such feeling. On the *Strand* pictures, the question is answered affirmatively fourteen times by J and eight times by M. It would seem from all these results that both Hobbes and Groos have expressed a wide-spread feeling in their theories.

Thirty-five reagents find something degraded or belittled in the Kemble picture—animal and vegetable life, the piper, etc. J finds something degraded or belittled in all sixteen pictures and M in nine of them. "Human ingenuity and Irishman's logic," "dignity of old age," etc., are among the things mentioned.

In regard to having a friend the centre of the joke, J answers affirmatively fifteen times in the case of the *Strand* pictures and says in one case the question has no significance. M says "yes" seven times, "no" two times and waives the question in the remaining cases. Fifty of the sixty reagents would dislike to be or have their friends be the person or persons around whom the comic of the Kemble picture centres. The following and other reasons are given: "the piper is lacking in ambition and serious ideas of life," he looks "common," "stupid," "senseless" and "not happy." Even the ten whose report on the question under discussion is negative, show by their remarks that there is really something, often very subtle, in the nature of a degradation in making a person that around which the comic centres. Taken all together these results rather confirm Bain's theory.

Contrast, Incongruity and Contradiction. Below is given what is mentioned by the reagents in connection with the Kemble picture, fifty of whom report their experiences under contrast, forty-three under incongruity and twenty-five under contradiction.

UNDER CONTRAST.	UNDER INCONGRUITY.	UNDER CONTRADICTION.
1. "The title and its representation." 2. "The dull stupidity of the piper and the joyous activity of the animals." 3. "The classical piper and the modern farmer." 4. "Man who most needs a spring is without one."	1. "The attaching of wire bed springs to the different objects." 2. "The human abandon of the movements." 3. "The human enjoyment on the faces."	1. As under incongruity. 2. As under incongruity. 3. As under incongruity. 4. "The exaggerated springiness of the animals." 5. "Perfect amity among animals." 6. "The title 'gentle' and the violent activity represented."

The overlapping in the above table shows that the word "contrast," used by certain writers on the comic, and "contradiction" and "incongruity," used by others, frequently refer to the same phenomena, and that, as far as ordinary experience is concerned, they might have been classed under one head. All but seven of the reagents report experiences which they classify under one or more of the heads just given. A critical examination of the reports of all the reagents as well as of the seven just referred to shows that in every case where the genuine source of the comic is inherent in the picture itself, it can be traced to the subtle transference of thought from the idea of something conceived of abstractly in its normal state, to the same thing now actually being perceived, but in new and alien relations. Not only is this true of the students who reported on the Kemble picture but it is a more conscious process with the two reagents who worked through the sixteen pictures which offer widely differing situations. If we accept contrast to designate what has just been mentioned as universally occurring, we can safely say with Schopenhauer, Hecker, Hoeffding, Spencer, Kraepelin, Wundt, etc., that *contrast is an essential element in the comic impression.*

The facts that two-thirds of the reagents record experiences similar to that of the reagent who says, "The picture would not have seemed nearly so funny to me, if I had not been led to expect something very beautiful," and that Lipps's theory stands the test of the varied material of the sixteen pictures in every case but three, seem also to point to disappointed expectation as an important factor in the comic impression and to give considerable support to the theories of Kant, Hoeffding and Lipps.

The Determining Factor in the Judgment. The reports show,

so far as the reagents are able to analyze their experiences, that thirty-nine of them are judging of the funniness of the Kemble picture according to the idea presented, and twenty-one according to the feelings aroused by this presentation. Of the first class, nineteen find the determining factor in the sudden transition of thought from the poetic idea suggested by the title to its absurd misrepresentation in the picture, thirteen state that the new and strange notion—variously termed “outlandish,” “queer,” “odd,” “ridiculous,” and “absurd”—of having wire springs attached to each object in the picture, determines for them its funniness. The remaining seven declare that the fun arises from the “utter impossibility” or “the absolute inconsistency” of a situation “so contrary to nature.” Fifteen of those who give “ideas” as the determining factor, admit, however, that they measure the degree of funniness by the intensity of their impulse to laugh. Of those who judge by the feelings aroused, fifteen give the impulse to laugh as the determining factor (the judgments of these reagents all fell above 4c), five surprise and one disappointed expectation. The reagents working on the sixteen pictures, fall into the above classes. M judges her experience wholly upon the ideas presented, and J upon the amount of laughter provoked.

That there is a subjective and objective side to the comic situation which is brought out by the above reports there can be no doubt—the presentation of ideas in a new and startling relation, incongruous, contrasting, contradictory, or what you will, and the reaction of the individual himself upon this conception while yet it is new to him. The students frequently show themselves conscious of this two-fold aspect of their experience. One says, for example: “The incongruity of the picture gives me the impulse to laugh and this makes me think that the picture is funny.” Moreover, what is often called “funny” at first is often called “odd,” “clever,” etc., at the end.

From all this it is evident that “the point of the joke” is inherent in the comic situation, and its appreciation is an intellectual process of peculiar and marked characteristics. It seems well to note in passing that this intellectual appreciation of the point of the joke is not always the primary source of humor in the experience. While practically all of the students recognize the point of the joke in the play on the word “Spring,” and many apprehend the double pun involved in “gentle spring,” some derive their greatest comic enjoyment from the movement and exhilaration depicted, “the springy, happy time,” as one puts it, and from the wire bed springs, attached to the animals, the plants and the sun, and others from the smiling faces in the picture, and the associations

aroused by the experience. With these last, the source of the fun is not inherent in the picture itself. It may be traced back to direct or immediate associations, that is, those aroused through what is presented in the picture, and to indirect or mediate associations, that is, those aroused through the imitation of the smiling faces. That is to say, the imitation of the smiling faces doubtless revives ideas and feelings which have become associated with the act of smiling, and the judgment based upon the imitation of such smiling faces is doubtless, therefore, largely based upon past ideas and feelings of an amusing character.

Theories of the Comic. Of all the theories, that of J's is most fully sustained by the answers to the questionnaire and the results of the experiments. She says, *her experience of the comic is pleasurable and is attended with an impulse to laugh, that newness or suddenness in the ideas and some element of incongruity or contrast are always present.*

The theories formulated by the reagents as a whole, however, and the same may be said of the theories quoted in the questionnaire, are incomplete in two respects:

1. They take no cognizance of phenomena which the reports show to have been important, and even essential, factors in their impression.

2. They do not lay the greatest emphasis on the factors which the reports show to have been the most important.

The difference of opinion shown below regarding the theory most applicable to the comic pictures studied is due doubtless to the same causes. To explain the comic in the Kemble picture, Schopenhauer's theory was named fifteen times, Spencer's eleven, Hobbes's eleven, Hecker's nine, Bain's seven, Kraepelin's five, Groos's five, Aristotle's four, Hoeffding's three, Kant's two, Wundt's two, and several others once. From these numbers it will be seen that several of the reagents selected more than one theory. In the case of the sixteen pictures, the two reagents not only selected the theory which seemed to them most satisfactory, but also noted what other theories taken as a whole were applicable. Only Schopenhauer's was found applicable to every picture by both reagents.

PLATE I.

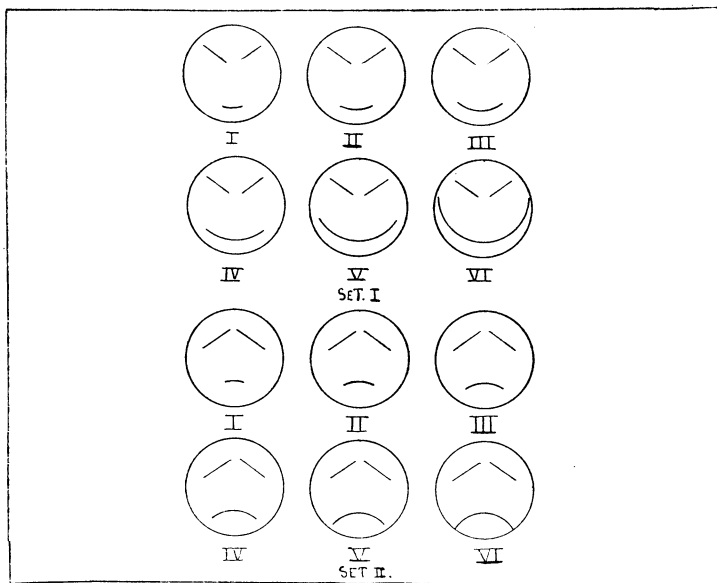
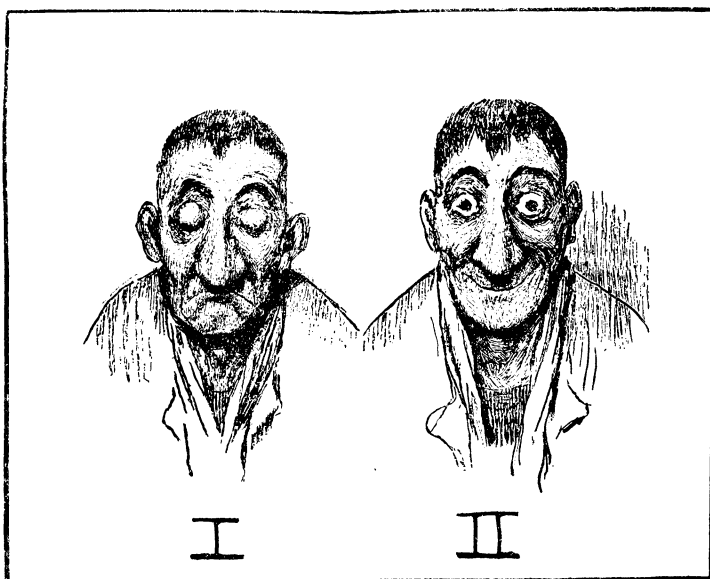
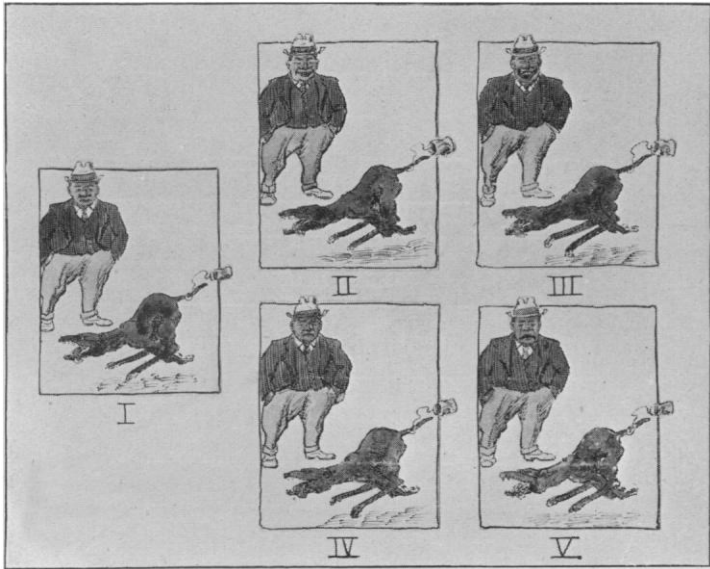
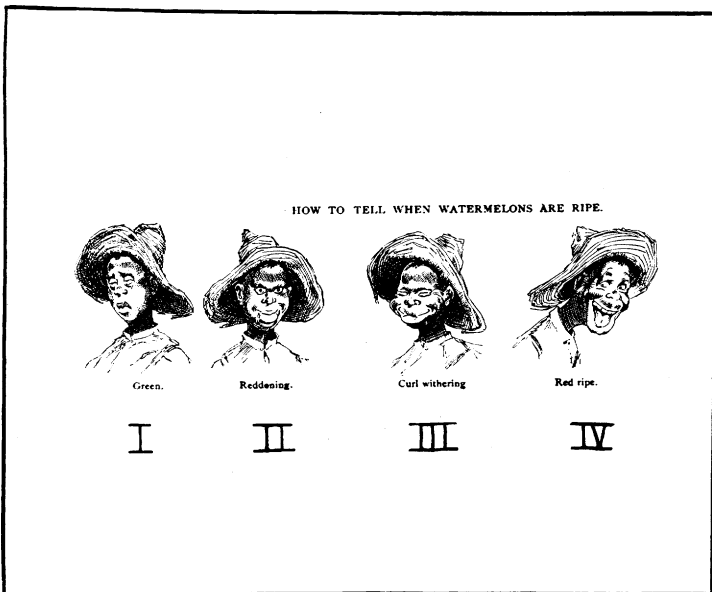
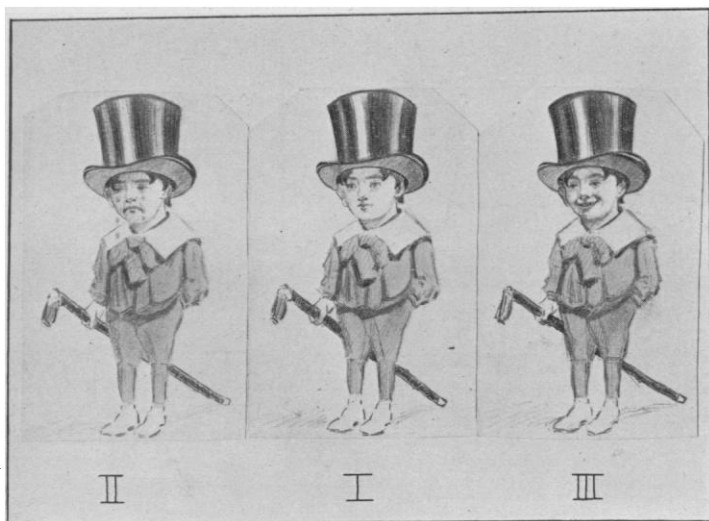
*Slide 1.**Slide 2.*

PLATE II.



Slide 3.



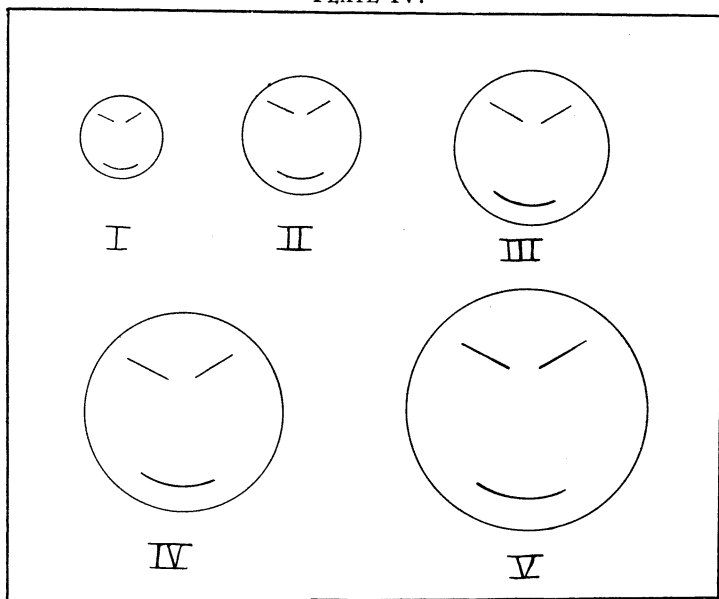


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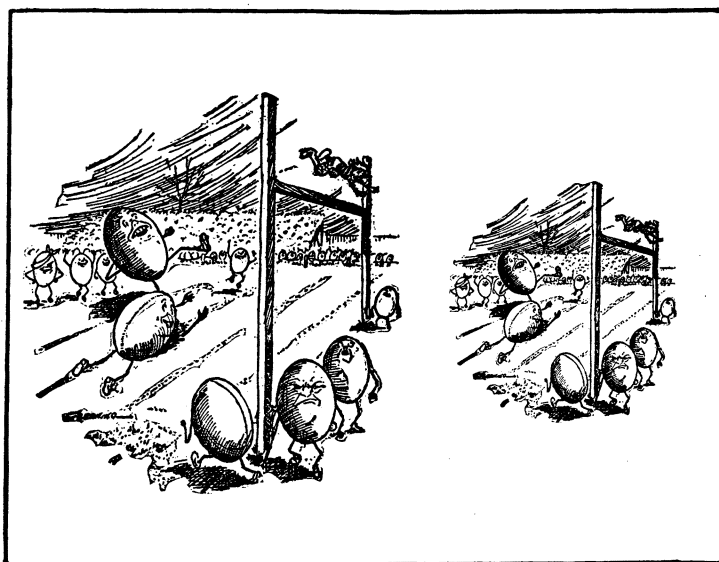


Slide 6.

PLATE IV.



Slide 7.



Slide 8.

PLATE V.

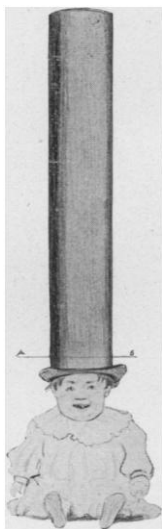
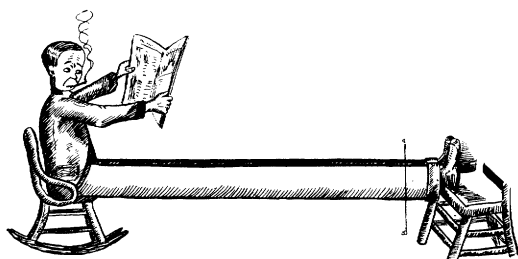
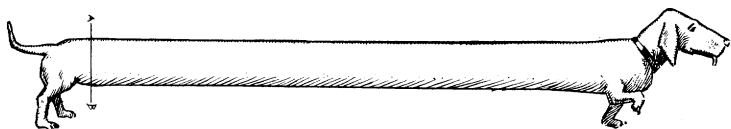
*Fig. 3.**Fig. 2.**Fig. 1.*

PLATE VI.



Spring, Gentle Spring.

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PLATE VII.

